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PREPARED BY

BUREAU OF NAVAL PERSONNEL

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FOREWORD

Naval Orientation (NavPers 16138-A) is a complete revision of earlier volumes bearing the same title. It has been prepared as a textbook and guide for midshipmen of the Naval Reserve Officers' Training Corps undergoing training and instruction preparatory to being granted commissions, and for officers of the Naval Reserve. The manual will prove useful to division officers and educational officers ashore and afloat, to officer instructors in various training activities, and to the individual officer who is unable to take advantage of formal training under the auspices of the United States Navy. For that matter, the manual should be of value to anyone, commissioned or enlisted, who has a connection with or an interest in the Naval Service.

COMPOSITE PHOTOGRAPH OF AMERICAN SEA POWER

This photograph, made from sections of four different pictures, shows some of the elements of sea power—ships, planes, supplies.

CHAPTER 1

THE NAVY AND SEA POWER

INTRODUCTION

Mission of Sea Power

The first person in recorded history to realize the importance of sea power for security was Noah. When his ship, the *Ark*, made landfall on Mount Ararat, not only had this diluvian navy fulfilled its mission for a new and hoped-for better world, but its captain had also demonstrated the first use of sea-air power, the function of the modern navy. The dove that Noah used for reconnaissance was the forerunner by some centuries of naval aviation: the eyes of the fleet.

This analogy is the only one that can be made between that early navy and the navy today. However, the basic purpose of each was and is the same: security. And this purpose will necessitate navies until civilization is achieved and war as an instrument of government has vanished forever.

The modern navy has reached its highest form of development in the United States Navy. On 2 September 1945, the day that Japan surrendered—appropriately aboard one of America's mightiest warships—this Navy exceeded in ships and equipment the total of the world's remaining navies combined. In numbers alone it possessed more than 100,000 vessels and 40,000 planes, manned by three and a half million officers and men. It was a Navy that had demonstrated effectively the Mahan credo that "upon the sea primarily must be found our power to secure our own borders and to sustain our external policy."

It is by sea power basically that our country has become strong, that it has grown and taken its place as the recognized leader today of world peace. The presence of units of the United States Fleet in the Mediterranean in the years after World War II has been credited by the State Department as the major single cause that a new World War did not break out in that troubled area. As an implement of our foreign policy, the United States Navy is our greatest instrument for peace.

Any implementation of United States policy—commercial, military, diplomatic—anywhere in the world, except toward our immediate North American neighbors, must utilize sea power in its broadest interpretation.

Seventy percent of the earth's surface is navigable sea. In time of peace the Navy has the right to go anywhere within three miles of the perimeters of that area without challenge. In time of war, 90 percent of the inhabited areas of the earth are within the radius of carrier-borne aviation, within present-day limitations. Sea power is as enduring a factor in the welfare of the United States as the oceans that surround it.

Today, the Navy, together with the Army and the Air Force, is a member of a team joined in the National Military Establishment. Instituted by the National Security Act passed by Congress in 1947, the National Military Establishment, under a Secretary of Cabinet rank, has as its aim the coordination of the activities of the three partners. Each has the primary mission of ensuring the security of the United States.

The Navy is responsible for the control of the sea. What does this mean? Will sea power continue to play a prominent role in our country's future? How will new ocean-crossing missiles affect the employment of naval forces? Has the atomic bomb made

SYMBOL OF ALLIED NAVAL STRENGTH AND JAPANESE NAVAL WEAKNESS
Surrender document, signed 2 September 1945 aboard USS *Missouri* in Tokyo Bay by Fleet Admiral Nimitz, opened the Pacific once more to the ways of peace.

all navies obsolete? If we are to face the future with confidence, these questions must be answered with logic and objectivity.

Sea Power Defined

The phrase *sea power* was coined more than a half-century ago by an American naval officer, Alfred Thayer Mahan, who first made the world conscious of the scope and possibilities of sea power. It is all too natural to assume that sea power consists only of the surface ships, submarines, and planes of the Navy, that is, the weapons of the Navy. But sea power actually is far more than weapons. Sea power represents a combination of all the elements that make possible control of the seas in war and peace. Many of these elements may, at first thought, seem to have not the remotest connection with a navy in action.

Geography is one important element. For example, the absence of powerful neighbors just beyond one's land frontiers increases the completeness of protection which a navy can give. National wealth is another factor, for naval protection is a form of insurance necessarily as expensive as it is valuable. Industrial strength is a third vital element, for it is essential now more than ever to produce the vast array of complicated mechanisms required in a modern naval war. Again, a people's natural aptitude in things maritime and mechanical is essential to produce personnel capable of operating the instruments of naval warfare. Finally, as Mahan pointed out, those other advantages cannot be capitalized fully unless a people, through its Government, appreciates and supports its naval possibilities.

Sea power therefore includes everything which makes a nation powerful upon the sea; all the continental and overseas resources contributing directly or indirectly to the country's maritime strength. Farms, mines, factories, internal transportation, and communication systems—all are a part of sea power. Thus the Florida fruit grower producing oranges to feed the members of a carrier's bomber squadron is properly a part of sea power. So is the Oregon lumberman who fells the Douglas fir to strengthen the deck of a damaged warship. The roots of modern sea power grow deep and strong within the very soil of the homeland.

Accepting this concept, as indeed we must, we can never, for example, confuse sea power with fleet strength, nor consider capital ships alone a true measure of fleet strength; nor can we believe we have the true index of a nation's sea power by counting the number of its fighting ships.

HISTORY OF SEA POWER

Sea Power in Ancient Times

Throughout history, the nation that has known sea power to be its way of life and destiny has become prosperous and powerful, and has made the most enduring contributions. Conversely, the nation that has traditionally failed to realize the value of sea power and to understand how to use it has never survived for long as a first-class power.

There is evidence that sea power was an important influence in history as far back as 4,000 years ago. The ancient Cretans, who are credited with being the first possessors of a navy and a merchant marine, were at that time dominating the peoples who lived on the shores of the Aegean Sea—now Greece and Turkey. The Phoenicians were next to prosper from their mastery of the sea, and they are often referred to as the real pioneers in the use of maritime power.

Greece, a land of peninsulas, intimate with the sea, was marked for conquest by Persia in 492 B.C. The Greeks managed to beat off the invaders twice in the ensuing twelve years, but the Persians reigned supreme on the sea and kept the Greeks bottled up. Then the Greek gods told the Athenians to put their trust in wooden walls, which Themistocles cannily interpreted to mean ships. When the Persians tried to invade again, the Greeks were prepared with a navy of their own. In the decisive battle of Salamis in 480 B.C., the Greek fleet outmaneuvered the Persians and beat them badly. The surviving Persians ships fled, leaving the army to disintegrate and starve in an enemy country, and Europe was saved from Orientalism. The ensuing period of peace, prosperity, and productivity in the arts, known as the Golden Age of Athens, lasted—significantly enough—just about as long as the Greek city-states maintained their collective sea power.

Rome, which succeeded to greatness first by alliance with the powerful Greek city-states, and more enduringly by absorption of Greek culture, had as its greatest rival the ancient Phoenician colony of Carthage. At the outset of the Punic Wars, Rome had no navy but she quickly learned that sea power is the foundation of any maritime empire. It was Roman sea power that forced Hannibal to take the difficult overland route to Italy via Spain and the Alps and thereby lose half his army. And it was Roman sea power that spelled the ultimate and complete destruction of Carthage. For 600 years afterwards, Rome was the undisputed mistress of the seas. Thus was Rome reluctantly forced into sea power, and through it she gained an empire.

The transfer of the capital of the Roman Empire to Constantinople in the 4th century enabled Christianity and western culture to survive while Rome and Europe disintegrated and descended into the dark ages. Besieged by a succession of enemies, Constantinople fell in the 13th century. Three-fourths of the city was burned, and with it the great treasure of art, science, and literature salvaged from ancient Rome. When the Mohammedans in 1453 made an assault upon the city, they found it easy prey. The refugees, bearing within themselves the learning of the ages, spread through Europe, and with a few salvaged books sparked into life the Rennaissance.

Venice succeeded Constantinople as the great sea power of its era, but the Mediterranean was now a Moorish lake where once it had been "Mare Nostrum." This put a halt to European commerce with Asia and Africa except at the extravagant risk of paying tribute to one pirate king after another—a custom which was to prevail until American sea power abolished it more than 350 years later.

Sea Power and Colonization

The age of exploration and colonization was, obviously, the age of sea power in its broadest applications. The nations employing it became rich and powerful. They profited by what ships brought them, and the world profited by what they sent forth in ships. Inevitably there were collisions between the rivals for the Atlantic, and wars were fought between opposing sea powers. When sea power meets sea power, what are the factors that determine who shall be the victor?

The answer is obvious. All other things being equal, victory is assured the contestant who has the soundest knowledge of the sea and of the use of ships on the sea. It is "know-how"—the combination of technical knowledge and practical skill—that makes a Drake the master of a Duke of Medina and sets a Nelson above a Villeneuve.

Three great maritime powers—Spain, Portugal, and France—each of which made great and enduring contributions to discovery, exploration, and colonization overseas, finally crumbled either because they did not fully understand the use of the sea, or because their comprehension was inferior to that of their opponent.

Portugal's gaudy but brief career as a sea power was extinguished by her stronger rival and enveloping neighbor, Spain.

Spain, we know, gained through sea power an empire which has since been divided into half-a-hundred sovereignties, but the Spanish language and Spanish customs still persist from the Philippine Republic to Mexico and Patagonia.

Probably no investment in history yielded greater dividends than the $5,000 or so with which Queen Isabella staked the voyage of Columbus out into the western sea. Before long, the steady stream of silver and gold from those distant shores was pouring millions a year into the royal treasury. That situation called for protection by a seagoing navy, which had to be built from almost nothing. The treasure-laden ships sailed not singly, but in a group, shepherded by warships. Here we have an early appearance of the task force; that is, a group of ships assembled for a specific task, in this case, to form a convoy.

For a considerable part of the century, Spain enjoyed control of the seas, coming and going when she pleased, and keeping others from doing likewise. Indeed from 1492 down to 1588 Spain stood in the forefront of the nations of Europe. But Spain was a classic example of sea power expressed in terms of quantity instead of quality.

In 1588 her king, Philip II, determined finally to end the all-too-successful English raids on Spanish ships and ports by attacking England with what seemed an irresistible military force. A fleet of 130 ships, manned by 8,000 sailors and carrying 19,000 soldiers, comprised the Spanish Armada. To oppose it, the British had 90 ships, plus a sort of mosquito fleet which never saw action, and the "know-how" personified in Sir Francis Drake and his men.

The Armada was organized along the same lines as an army, and it was under the command of a general, the Duke of Medina-Sidonia. Drake used the sea as his ally while Medina fought the sea. That action marked the turning point in naval tactics. Until that time, naval battles had been virtually "infantry fights on floating platforms." If ramming did not sink an enemy ship, soldiers were sent swarming over her side to engage in hand-to-hand conflict. The English, however, planned something quite different on this occasion. They had developed a type of warship that could be maneuvered to windward of the Spaniards and pound them with artillery from a distance. This deprived the soldiers of the opportunity to come to grips with the enemy. The big lumbering Spanish ships, with their towering upper works, were splendid targets; they, too, had artillery but were not prepared to use it in this sort of fight. Like most belligerents caught unprepared by a novel enemy development, the Spaniards considered the new tactics unsportsmanlike. As it was, a badly battered half reached home, to inform Philip that Spain's sun had begun to set. The lack of understanding of sea power cost Spain her preeminence in the world of the 16th century.

From that time on, gunnery gradually replaced shock action in battles at sea. The cries of "Boarders away!" and "Stand by to repel boarders!" grew gradually less frequent. The day was still far distant when ships would become targets while still hull down on the horizon, but that was the direction of naval progress after that decisive Armada action.

The French did not have the economic compulsion to take to the sea that impelled the British and Dutch. They had plenty to do at home, cultivating their rich land and defending it against predatory neighbors. Traditional French thrift begrudged money spent on ships. It even imposed on French naval captains a policy of avoiding risk—a policy not designed to control the seas by destruction of enemy naval forces, but merely to dispute them by commerce raiding. In the end, that policy cost France both her navies and her merchant fleets, and with them Canada and other overseas colonies, all of which contributed to the national exhaustion from which France never recovered except during the brief resurgence under Napoleon.

Napoleon, although a master strategist on land, had but little knowledge of war at sea, and this, combined with the inaptitude of his admirals finally led to the defeat of all his plans. He looked in vain for a naval officer who really understood sea power. "The great weakness of our navy," he said, "is that the men who command it are inexperienced in all the hazards of command. I look increasingly for the right naval officer without being able to find him. In that profession there is a specialty, a technicality, which put a limit to all my conceptions."

Characteristic of the superior use of sea power by the British are the naval aspects of the Napoleonic Wars. It was the combined land forces of Britain and her allies that eventually crushed Napoleon's armies and broke his power. But sea power had been working silently and relentlessly to contribute to that end. Sea power enabled first Sir John Moore and then the Duke of Wellington to conduct a war on the extended flank of the French in North Africa, in Spain and in Portugal, and then at the strategic moment to shift those same troops to Flanders on the way to Waterloo. Nelson laid the foundations for this mobility in the great victories of the Nile, Cape St. Vincent, and Trafalgar, which closed the sea to the French but made it an open highway for the British. British land forces were never more than fractional compared with Napoleon's Grand Army. But necessity required that soldiers be stationed everywhere in Europe while the British needed to strike only in one spot of their choosing. Sea power enabled the British to apply concentrated power against Napoleon's weak point on his own territory.

Sea Power and the United States

In the meantime sea power was playing a big part in history on this side of the water. The American Revolution in all its main features was a maritime war, and it was sea power—not so much American as that of the triple forces of France, Spain, and Holland—that eventually won independence for the colonies.

General George Washington understood sea power, knew how to use it, and developed into something of a naval genius before the war was over. "In any operation, and under all circumstances," he said, "a decisive naval superiority is to be considered as a fundamental principle, and the basis upon which every hope of success must ultimately depend." Again he said, "whatever efforts are made by land armies, the navy must have the casting vote in the present conflict. . . . A constant naval superiority would terminate the war speedily; without it, I do not know that it will ever be terminated honorably." Later as President, Washington pointed out that our commerce required a naval force to protect it and then added something which the American people promptly forgot: that "the most sincere neutrality" offered in itself "little protection against the depredations of nations at war." Only a navy organized and ready to vindicate it from insult or aggression could, he said, "secure respect to a neutral flag," and he added that such a force might "even prevent the necessity of going to war" at all.

It was during the Napoleonic Wars that American sea power was first used to implement the foreign policy of the recently created United States. We, along with other nations, had for some time been paying tribute to the so-called Barbary Powers, in order to prevent the seizure of our shipping by pirates of these countries. This practice was ended when it was finally decided that gunpowder instead of tribute was the best solution to the problem. During the next few years some of the brightest pages of American naval history were written.

In the War of 1812, British sea power almost proved our undoing. Despite a few highly successful frigate duels, our salt-water warships and merchantmen were eventually tightly blockaded by overwhelming forces. The American warships were pitifully few compared with the hundreds flying the ensign of the Royal Navy. The latter part of the War of 1812 found our nation almost completely shut off from contact with the outside world by a strangling British blockade. The waters off our shores were under the rigid control and ceaseless vigil of efficient, tireless British sea power. It was Perry and Macdonough and our "lake power" that saved us from probable disaster, for all the decisive actions were fought on the lakes.

In the Civil War, control of the sea was important and even decisive—and it was overwhelmingly in the hands of the North. For four years the Union Navy was constantly occupied with the tasks of blockading more than 3,000 miles of coastline, running down Southern commerce raiders, cooperating with the Army in capturing coastal strongholds, and opening the Mississippi and other waterways that led into the South. The South countered with commerce raiders, but the strangling effect of the Union blockade eventually took its toll. It crippled the finances of the Confederacy, shut out foodstuffs and munitions, and proved a major factor in deciding the outcome of the war. The country learned or should have learned, however, from this war that a navy could not be quickly and readily improvised in an emergency. The days were past when merchant vessels could be converted rapidly into efficient men-of-war.

When the Spanish-American War broke out it was at once recognized that the conflict would be primarily naval, and would be won by the nation that secured control of the sea. The paper strength of the two navies was about equal, but the Spanish Navy was characterized by poor equipment, incompetence, and lack of trained personnel. Both at Manila Bay and Santiago

ORANGES, WHEAT, AND LUMBER—THEY, TOO, ARE SEA POWER
To be militarily strong, a nation must have adequate reservoirs of food and materials for its fighting men.

the enemy's fleet was routed and there is hardly a record in naval history of such complete destruction. The war was over, and again sea power was triumphant.

Sea Power in Two World Wars

World War I was similar to the Napoleonic Wars in that it was a struggle between land power predominant on the continent and naval power supreme on the seas. It was Germany's lack of comprehension of sea power, together with her failure to foresee England's inevitable participation in the war, that ultimately brought about her defeat. It should have been obvious that England could not remain neutral while Germany overran Europe, and that the British Navy rather than the French Army was the principal barrier to German success. A correct appraisal of this situation as early as 1905, when Germany began in earnest to build up her naval strength, might have resulted in a reallocation of Germany's war-making resources in order to provide a navy strong enough to defeat Britain's and at the same time to have an army strong enough initially to hold Germany secure as a naval base from which to destroy British and French sea

GERMAN U-BOATS AGAIN MEET FAILURE
In two World Wars, the German U-boats came close to victory—but not close enough. The illustration shows Americans boarding U-boat 505, one of the most dramatic captures in World War II.

SUNSET IN TOKYO BAY
Allied might gathered in Tokyo Bay on the evening of 27 August 1945, prior to signing of the surrender document. Mount Fujiyama is in the background.

power. When that had been accomplished, an enlarged German Army might have completed the task of overrunning the Continent—and England, too. As it was, the German Navy, planned and constructed by Von Tirpitz, was almost, but not quite, big enough.

Admiral Ernest King has summarized the part played by sea power in World War II:

> In the European war, sea power was an essential factor because of the necessity of transmitting our entire military effort across the Atlantic and supporting it there. Without command of the sea, this could not have been done. Nevertheless, the surrender of the land, sea, and air forces of the German Reich on 8 May 1945 was the direct result of the application of air power over land and the power of the allied ground forces.
>
> In the Pacific war, the power of our ground and strategic air forces, like sea power in the Atlantic, was an essential factor. By contrast with Germany, however, Japan's armies were intact and undefeated and her air forces only weakened when she surrendered, but her navy had been destroyed and her merchant fleet had been fatally crippled. Dependent upon imported food and raw materials and relying upon sea transport to supply her armies at home and overseas, Japan lost the war because she lost command of the sea and in doing so lost—to us—the island bases from which her factories and cities could be destroyed by air.

In World War II the Axis Powers again demonstrated their ineptness and incapacity to make the best use of their resources in sea power. Again Germany failed to make provision for contesting control of the sea by building an adequate number of ships. But even so, if the Axis Powers had correctly estimated the strategic importance of the Mediterranean and if, early in the war, they had concentrated all possible naval resources in that area with the Italian fleet as the main striking force and with their other military forces operating in support, the story might have been different and the Mediterranean might well have become an Axis lake. Under such circumstances the Allies' African campaign would have faced almost insurmountable difficulties.

Controlling the seas, England held a slender tenure in the Mediterranean while our own power was being assembled. Later, with the combined strength of our sea power, we conducted the great amphibious campaigns that were each a stepping-stone to final victory —North Africa, Sicily, Italy, Normandy, the Mediterranean coast of France. The story is told in a single comparison. After crushing France early in the war, Hitler attained supremacy in the air but was unable to cross the twenty-mile barrier of the English Channel. On the other hand, the Allies controlled the seas and, when they were ready, crossed thousands of miles of the Atlantic to strike where they willed.

SEA POWER IN MODERN TIMES

Japan Loses Control of the Sea

In the Pacific, with local control of the sea, Japan was able to capture Singapore, the East Indies, the Solomons, and threaten Australia itself. When she had lost this control she was unable to send men, supplies, and ships to the aid of Okinawa—threshold of the home island. Before we broke Japan's sea power, our range of operation was limited. As we reduced Japan's Navy, and as our own ranged more and more freely, it became possible not only to skip long distances but also to omit whole operations.

Because of the effects of sea power, our landings in Leyte and Lingayen were ahead of schedule. Lack of ability to move on the sea prevented the Japanese from exploiting their strength in the Philippines, and from satisfactorily reinforcing their troops at our point of attack. Control of the sea made it possible for us to move past many islands and through many waters that were controlled by the enemy.

Sea power permits multiple use of the same force; a small army becomes in effect many armies. With a handful of divisions, the Pacific Area forces swept westward across the central Pacific, and General MacArthur's pushed northward. In the islands of the Pacific the Japanese had a strong numerical superiority, but without freedom to move at sea a large portion of those troops never got into combat. Where our strategy did not require attack, we left them behind, with the result that as far as the issues of war were concerned, these troops might as well not have existed. They were, moreover, a liability to Japan in that they were a drain upon her supplies and resulted in a dispersal of her strength. Without sea power, the Japanese legions were helpless; with sea power, our few divisions were superior to the many that opposed them. At the war's end, tens of thousands of Japanese in New Britain, the Marshals, Truk, Mindanao, the East Indies, and elsewhere surrendered without ever having struck a blow to assist their comrades who met destruction all along the way, from Tarawa to Okinawa. Unified, they could have overwhelmed the handful of divisions we employed; but divided and enmeshed in the unseen, endless coils of our sea power, they were helpless—impotent spectators of the disaster that befell their homeland. Japan's destiny had been in the hands of a few men who did not understand the meaning or the use of sea power.

Nations that have failed in peace to comprehend fully the extent to which sea power controls their destiny have frequently failed to employ it properly as an instrument of war and so have been defeated. A critical study of German naval strategy and tactical operations in World Wars I and II will reveal many violations of the fundamental principles of warfare that contributed heavily to ultimate defeat. It is too much to hope that possible enemies of the future will again make the same mistakes.

Sea Power and Naval Blockade

As we have seen, sea power means more than controlling the seas for one's own use; it means denying their use to the enemy. This can be accomplished by blockade—closing the sea roads to starve the economy of a nation. At the same time, the resources of the world are diverted to the controlling nation. Some understanding of sea power's benefits can be gained from figures released in a report from General MacArthur's headquarters in Japan.

These figures reveal that the peak wartime production of steel ingots in the Japanese Empire occurred in 1943 when approximately 9,600,000 tons were produced. By 1945 the steel industry was producing at the rate of only 120,000 tons a year. The report further indicated that 1,800,000 tons of the annual capacity were erased by bombing. How then can we account for the remaining 7,800,000-ton loss in production? The answer is: Naval blockade.

Further tangible evidence of the manner in which our sea warfare helped break down Japan's economy is found in still another part of this report. In 1941 a total of 4,000,000 tons of iron contained in iron ore were required by the Japanese steel industry. Only 20 percent of that amount was produced in the Japanese home islands; the balance of more than 3,000,000 tons had to be imported from the Asiatic mainland and from the Philippines. As the naval blockade grew tighter, imports dropped off, and by 1944 the iron content of imported ores added up to less than 30 percent of the tonnage imported in 1941.

It is also known that at the end of the war Japan still had a formidable air force numbering many thousands of planes. Yet these were virtually grounded by lack of fuel—again testifying to the effectiveness of blockade. For it is axiomatic that since the industrial potential is so essential in developing sea power, the destruction of that potential in an enemy nation is of equal importance in weakening his sea power.

Sea Power in Peacetime

We have seen the sensational effect of United States sea power in wartime. We know, too, how easily our sea power is relegated to the extreme background of men's thinking once the shooting has stopped. Admiral Sims two decades ago compared our Navy to a form of insurance, the value of which can be properly appreciated when its need is immediately at hand. It is difficult to make the man in the street realize the need for sea power when passage on the sea lanes is undisputed.

One vital aspect of sea power is the preservation of our maritime commerce in peace as in war. Admiral Mahan has well expressed the commercial requirements of any country bordering upon the sea: "Foreign necessaries as well as luxuries must be brought to its ports, either in its own or in foreign ships, which will return bearing in exchange the products of the country, whether they be the fruits of the earth or the works of men's hands. The first and most obvious light in which the sea presents itself from the political and social point of view is that of a great highway."

Another important service that the active instruments of sea power perform also in peacetime is the import of strategic materials. No nation is materially self-sufficient. All nations must utilize the seaways to obtain products that they lack or that they cannot produce in adequate amount. The United States depends on sea power to provide us with tungsten and antimony from China, tin from Bolivia, manganese and platinum from Russia, chrome ore from Rhodesia, mercury from Spain, jute and shellac from India, hemp from the Philippines, rubber from the Malay States, wool from Australia, sugar from Cuba, coffee from Brazil.

Naval research, too, continues in peace. Actually, research achieves its greatest progress in the years before a war. All that can possibly be done during a period of hostility is to convert already available scientific knowledge into developments that will speed the victory.

But the principal importance of sea power as an active force for the maintenance for peace lies in the fact that a formidable fleet is a strong deterrent to war. Every would-be world conqueror now knows that the United States is the check-mate to such ambitions as inspired Tojo, Mussolini, and Hitler—as well as Kaiser Wilhelm before them. These four—fortunately for us—failed in a true comprehension of sea power.

In another war it might not be a Belgium or a Poland which would-be conquerors would strike first, but the United States. Some future Hitler might not make the mistake of attacking the United States last, after this nation has been able to mobilize its irresistible resources of men and material.

If we remain strong, that attack will probably never be made. It follows inevitably that a powerfully armed, benevolent, peace-loving United States is the greatest possible deterrent to another world war.

Sea Power: Cornerstone of National Security

Until aircraft can economically carry whole divisions and land them at will despite terrain, weather, and artillery—and maintain an unbroken line of supply in overwhelming quantity of replacements and munitions—sea power expressed in ships alone can keep war from American soil and carry it to the enemy's territory. It should be remembered that the active components of sea power are the combatant ships together with the auxiliary craft and the merchant marine. This is not to overlook the fact that a part of air power, a highly specialized part, has become an essential part of sea power. Carrier-based aviation is still the only means of providing a mobile,

ONE SNEAK RAID CANNOT WIN A WAR
Though the Japanese sank our battleships at Pearl Harbor, our great force of warships, transport craft, and planes through repeated successes brought final victory.

USS *HORNET*, STRUCK BY JAPS, BURNS AND SINKS

But before World War II ended, another *Hornet* was afloat, the product of America's vast industrial resources and manpower.

tactical air force at distances far removed from prepared air bases, and is the backbone of the modern Navy. The capital ship today of the United States Navy is the carrier.

The United States is an island—a veritable Treasure Island. Comparatively underpopulated, with its natural and industrial resources developed beyond any other nation's attainment, a militarily weak United States would make a tempting prize for modern conquistadors.

Twice within a generation, aspirants for world conquest have made the mistake of attacking the United States last, giving this country the time to organize itself for the inevitable combat. The next would-be conqueror may succeed, unless we are prepared to make such an attack so costly, so doubtful of success, that it will not be attempted.

In any blueprint for national security, sea power is fundamental. Assuming that a future enemy should attack us without a navy comparable to ours but with comparable air, rocket, and atomic power, we should still be able to win the war by retaliating at close quarters with our mobile naval forces.

The United States is a maritime nation and its strategy must be a maritime strategy. Though it is flanked by two large oceans, we can rely on them no longer as barriers against war. We need a two-ocean navy to supplement the Atlantic and Pacific and to prevent a hostile nation from landing on our shores. Passive resistance is no longer enough, however, for in a future war, we should have to carry aggressive action to enemy territory. In its comparative isolation, the United States, having a navy, could be bombarded by transpolar missiles, but it could not be defeated until an enemy had successfully invaded and occupied the country. If an enemy should make such an attempt, we would have to carry aggressive action to enemy territory; without a navy we could not do it.

It is also significant to note that the importance of sea power to us as a nation has grown with our rise of power and influence. As our international responsibilities have multiplied, our reliance on the seas has increased. No enemy can reach us without crossing on, over, or under ocean masses. Nor can we reach the enemy. Neither can we join with our friends in the international enforcement of peace unless we can move across the sea.

Too many Americans have a misconception of the Navy's task, possibly born of that time-honored but often misinterpreted title "The First Line of Defense." They think our primary duty in the Navy is to repel invasion by sea. Actually, that would be a last, desperate duty for the Navy to perform and a clear indication that we had already failed, or come perilously close to failing, in our primary mission, which is to gain and maintain for our country and its allies the use of the sea and deny it to the enemy. The Navy is in reality our "First Line of Offense."

The Navy Is Progressive

Tradition has always been a vital force in the progress of the United States Navy. The Navy looks to the past, but not for the traditional weapons of the past. It looks to the past for valuable lessons learned through hard experience. For example, the battleship was once the backbone of our fleet. In World War II, it was still highly useful but had yielded the primary role to the aircraft carrier. In future years the carrier of today may give way to some craft yet undesigned —or, possibly, to fleets of submarines armed with guided missiles. We are not wedded to any fixed concept of naval defense or offense. As Mahan has pointed out, sea power is concerned more with the control of the sea than with the tools whereby such control is attained. We shall continue to change, revise, and adapt our naval weapons to meet the ever-changing conditions of warfare. We shall be dependent on sea power as long as we remain a maritime nation—in other words as long as we are surrounded by oceans and air above them.

Now as the Navy enters a new phase of scientific development—a phase in which atomic weapons and guided missiles increase destructive power for offensive warfare—it is timely to reexamine the potentialities of sea power.

To the question, "Will sea power survive?" only one answer is possible: Yes. The mere creation of a new threat, however grave, to ships and shipping has never stopped men from using the sea—either for carrying on commerce or, unfortunately, for carrying on war. A new type of weapon is adapted for use at sea. It sometimes causes radical changes in ships, aircraft or weapons. It is used to increase the power of the Navy if its use will increase the ease of control of the sea. As long as men rely upon shipment across the sea there will be need to control that sea.

The most significant point to remember is that the Navy, since its birth, has undergone constant change and evolution; it has demonstrated a flexibility that has served not only to keep it always abreast of current science but also to lead the way.

In 150 years the Navy has gradually changed from sail to steam, from coal to oil, from muzzle loaders to breech loaders, from smooth to rifle bores, from wood to steel, from a few types of surface ships to a hundred varieties of craft for every purpose. Constant alertness to change and progress has characterized the Navy's development from earliest days.

In the past, weapons have been devised that seemed temporarily to threaten the existence of the Navy, but each time the Navy has either developed an effective countermeasure or has incorporated the new weapon into its own offensive pattern.

The technical history of warfare has been a series of developments, which in turn were followed by countermeasures. In the USS *Constitution*, better known as "Old Ironsides," our Navy had produced a frigate far ahead of her times. Commissioned in 1798, she was at that time superior in strength of armament to any other frigate in the world. This caused other powers to concentrate on heavier ordnance. Our own naval shell gun was outstanding in that field, but when greater defense was needed against projectiles, armored ships were born in the imagination of ship designers.

When the *Monitor* fought the *Merrimack* at Hampton Roads in 1862 it was the first time in history that two ironclads faced each other in battle. The results of that contest convinced many that guns in the future would be unable to overcome shipborne armor.

The appearance of the submarine at the turn of the century theoretically imperilled the existence of surface ships. But scientists soon developed effective detection apparatus, ranging from hydrophones to supersonic detectors. Defensively we developed high-powered depth charges to fight enemy subs; offensively we incorporated submarines into our fleet's pattern.

With the appearance of the airplane many prophesied the doom of all navies. "Air power will wipe all vessels from the seas," they predicted. Yet the Navy not only developed potent defenses against air attack—in the form of radar, antiaircraft gun directors, and proximity-fused projectiles—but it also wove the texture of aviation into its over-all offensive fabric with telling effect, so that today aircraft and the control of aircraft are intrinsic parts of sea power.

In November 1910 successful experiments with aircraft landing on and taking off from the decks of ships led to the development of the carrier. During the occupation of Vera Cruz in 1914, the Navy first made use of an airplane for scouting. In the development of dive bombing techniques, the United States led the world.

And thus we see that the existence of the Navy has never seriously been threatened by any new weapon. Moreover, it has consistently demonstrated that it can integrate any newly conceived instrument of war into its ever-changing pattern for insuring the security of our nation.

As previously stated, the complete reliance on one weapon or on one solution for future wars is dangerous. Warfare is immensely complex and there is no cheap and easy solution to its manifold problems—certainly it is impossible ever wholly to anticipate its requirements. It is well to remember that no weapon is equally good at all times or in all places. For the Pacific war, the carrier task force was ideal—and decisive. In the unpredictable future it might be totally ineffective.

One may assume that the best scientific minds in and out of the Navy will face any challenge which the atomic future may hold.

The Navy and the Atomic Age

It must be conceded that as yet no effective measures have been developed to counter the effects of atomic explosion. The best countermeasures will be destruction of the bomb carrier or destruction of the bombs before they are placed in the carrier. Our thinking must therefore be directed at destroying the carriers and exploding the bombs en route to their targets. It is possible that radio waves may be used eventually to detonate atomic weapons at a distance, but the technique, whatever it may be, is still a thing of the future.

In even the best-conceived defense it must be assumed that some bombs may get through. This does not mean that ships and navies will disappear. There are several reasons for believing that even during the atomic age, there will be a vital place for air, surface, and sub-surface ships. It is definitely known that ships, because of their mobility, even when organized into task forces, are wasteful targets for any such concentrated weapon as the atomic bomb; and in comparison with shore bases they are even more unprofitable targets.

Closely concentrated as the target ships at Bikini were, for the purpose of subjecting them to maximum damage, only a portion of them were put out of action by the two atomic explosions. The principal damage was within a radius of 2,000 yards. In the tactical operation of task forces in the Pacific War 2,000 yards was frequently the interval between ships. It is to be expected that the introduction of atom bombs will force wider dispersal than in the past.

Mobility is a navy's greatest safeguard against modern weapons. The ocean areas of the world comprise

FLOATING AIRSTRIPS MEAN MOBILE POWER
Aircraft carriers with their many planes ready for scouting and striking insure control of seas. Sinking of vast numbers of Japan's ships by our Navy deprived her of that control without which a nation cannot remain a great naval power.

almost three-fourths of the earth's surface. The defensive position of a sea force is therefore proportionately increased. But because of a navy's freedom to travel these vast sea roads and its ability to range close to the enemy, attack becomes more accurate and weight is added to its offensive powers.

The system of refueling and supply developed in World War II enables a fleet task force now to remain at sea for weeks at a time, even months, without reliance on harbors and to function as an efficient mobile base. And the revolutionary techniques developed during the recent war enable it to operate on sea, air, or enemy shores.

As pointed out earlier, sea power's blockade eventually breaks down a hostile nation's economic system. But a navy's paramount objective is to maintain control of the seas for ourselves and to destroy all of the enemy's sea power including that part resting in his bases. Should it fail to achieve this goal completely, the fleet will still provide a distant periphery of defense on the farthermost frontier possible for us to maintain in an unpredictable world.

Such a periphery of defense, composed of ships and aircraft, is both effective and far more economical than the fixed-base concept of defense. Its principal strength lies in its ability to shift readily from defense to offense without long preparations and accumulation of forces.

Conclusion

Admiral Nimitz makes the following statement about the future Navy:

> What the future Navy will be like, we cannot say as yet. It may include battleships powered by an atomic plant, protected by unbelievable

THE PATTERN OF WAR SHAPES THE PATTERN OF DEFENSE

A popular symbol of yesterday's weapon for exercising control of the sea, the battleship has given way to newer forms such as amphibious forces, carrier task forces and hunter-killer teams which result in the powerful integrated strength of our Navy.

new materials, and firing jet-powered atomic missiles instead of sixteen-inch shells. It may include carriers launching radar and target-directed jet missiles instead of man-piloted airplanes. It may include submarines of very high speed both surfaced and submerged, making long voyages far beneath the sea to surface suddenly again off some distant enemy shore to launch their missiles, and then hiding themselves again in the ocean depths against retaliation.

Whatever it is like, there will still be a navy. Until air transport undergoes infinitely greater advances than have as yet been envisioned, world commerce must still be carried by oceangoing ships, and so, too, must armed forces with all their weapons and equipment for the final occupation that must force a final peace upon an enemy. And neither commerce nor armed forces can be transported over the seas, nor can foreign bases be maintained except under the protection of a navy.

Yes, there will still be a navy. It may not be necessarily a navy of battleships, or submarines, or carriers. It will certainly be a navy in the best sense —a mobile organization using ocean highways, carrying its own defense against any weapon directed against it by the enemy, and launching from its mobile platform whatever missiles—rockets, robot planes, atomic bombs—the Navy as an organization of men and minds has been able to conceive out of the limitless possibilities of science.

The primary mission of the Navy as repeatedly stated throughout this discussion is to *control the sea —to gain its use for ourselves, and deny its use to the enemy.* To guarantee the use of this great highway for the tremendous volume of our own traffic and to keep the enemy off it is the Navy's job. The traffic may consist of exports to our Allies or imports essential to our own war effort. It may be the transports of our invading Army, and, later on, ships to bring replacements and supplies to keep them fighting; or it may be ships carrying materials and equipment to set up new bases for our Air Force and to keep them supplied. But whatever the traffic, the Navy's business is to clear the way for it, and keep it clear—by driving the enemy's fighting forces off the sea, and out of the air over the sea, and at the same time sinking his merchant ships and transports.

One thing is certain: Although the fleets change, the meaning of and need for sea power remain constant. In changing, the Navy will always seek to change wisely, ever setting as its goal protection of the nation from overseas invasion with the weapons the times require. The sea remains a constant, and sea power in whatever terms it is expressed means control of transoceanic traffic.

America's mature sea power, therefore, will have a vital part to play in the world of tomorrow. It can continue to be a great influence for peace and order in the world.

The Navy of the United States is necessary to the nation and to the world not as an instrument of terror, of force, or of subjugation but rather as a guardian first of our own liberties and then as co-guardian, with other nations, of freedom under law throughout the world.

CHAPTER 2

MAKERS OF NAVAL TRADITION

The worth of a sentiment lies in the sacrifices men will make for its sake. All ideals are built on the ground of solid achievement, which in a given profession creates in the course of time a certain tradition, or in other words, a standard of conduct.—*Joseph Conrad*

INTRODUCTION

Men and Tradition

Throughout the history of our country, regardless of the size of our Navy—and it has often been pitifully small in number of ships—there has never been any doubt of the quality of the men who fought and commanded them. It is essentially this personnel—officers and men who are the makers of naval tradition—that we consider in this chapter.

Reminders

A visitor to the Naval Academy at Annapolis is greatly impressed and even awed by the innumerable reminders of our naval heritage. Here is found the memorial to John Paul Jones, which keeps alive his memory so that those who follow may go on with lasting inspiration. In Bancroft Hall hangs Perry's flag of blue bearing in rough, white muslin letters Lawrence's famous slogan, "Don't give up the ship." On all sides appear monuments commemorating the names and deeds of great American naval heroes. There is the wide brick walk, called Decatur Walk, that leads to the Tripoli Monument; the gymnasium known as Macdonough Hall; and the massive armory—Dahlgren Hall. Overlooking Chesapeake Bay is Farragut Field where the Navy football games are played; Porter Road where the heads of the academic departments have their quarters; and Dewey Basin from which launches leave to visit ships lying in the bay. There are Luce Hall, Mahan Hall, Maury Hall, and Sampson Hall which contain the recitation rooms for the midshipmen.

These men who have been so honored, and many others, are the makers of naval tradition. There is magic in these names, and the midshipmen feel their spell.

AMERICAN REVOLUTION

A Maritime War

The Revolutionary War presents the only period in its history when the United States stood in desperate straits because of lack of imported strategic materials. Thanks to the low state of efficiency of the usually invincible Royal Navy and to the resourcefulness of the little American Navy and other Yankee mariners, General Washington was able to secure what he needed from beyond the seas. Also, in 1778, France, sympathetic from the first with the revolting colonies, openly entered the war on our side—it was due largely to this fact that the United States owes its independence—and France's action was soon followed by Spain and Holland. British possessions in every quarter of the world were attacked by the powerful French forces and Britain's internal struggle against her colonies was transformed into a world war in which all the great maritime powers were engaged. The chief theater of naval activity naturally was the West Indies where British interests clashed with those of her enemies—France, Spain, and Holland.

Unlike the large, strong Navy of today, the Continental Navy that fought America's war for independence was small and weak and was further handicapped by coming into existence only after fighting had begun. It was a makeshift force, two-thirds of its ships being old merchantmen. The crews were drawn from merchant vessels, fishing craft, and even from the Army. In addition there were state navies, but these vessels were small and designed for river and harbor defense. Also there were swarms of American privateers (privately owned craft outfitted for war) which engaged primarily in the capture of British prizes. All in all we had pitifully few ships compared with the hundreds flying the white ensign of the Royal Navy.

John Paul Jones

Emerging from this war was one of the Navy's greatest heroes and tradition-makers—John Paul Jones. Of course there were others, such as John Barry, Lambert Wickes, and Gustavus Conyngham, all of whom epitomize the daring and leadership abilities that have always characterized naval heroes. But Jones embodies all the attributes that a nation traditionally assigns to its greatest heroes.

Of his many contributions to the greatness of the Navy, none stands out more conspicuously than his qualities of daring and enterprise. During the war, in the classic action between Jones's ship, the *Bonhomme Richard*, and the British frigate *Serapis*, Jones faced an enemy of vastly superior strength. During the early stages of the battle, a steady flow of cannon fire poured forth at close range, and Jones's old, rotted craft was rapidly reduced to a critical state. Her hold had filled with three feet of water; her guns were out of commission except some nine-pounders; half the crew had been killed or wounded; her rudder and rigging had been shot away; and fires were fast approaching the magazine. It was at this point that Captain Pearson of the *Serapis* called to Jones, asking whether he had struck his colors. Though barely able to keep afloat, Jones thundered back his famous answer, "I have not yet begun to fight." These were more than mere fighting words, for they inspired his men with his own determined will to win.

After fighting for nearly four hours, the British surrendered; and since no one else dared venture on deck, Captain Pearson himself hauled down the colors on his battered ship. The spirit of the offensive, the will to victory, was never better demonstrated than by Jones on this occasion. Deeds like this live and fighting slogans like this survive. "I have not yet begun to fight" inspires Americans today as it did more than 150 years ago.

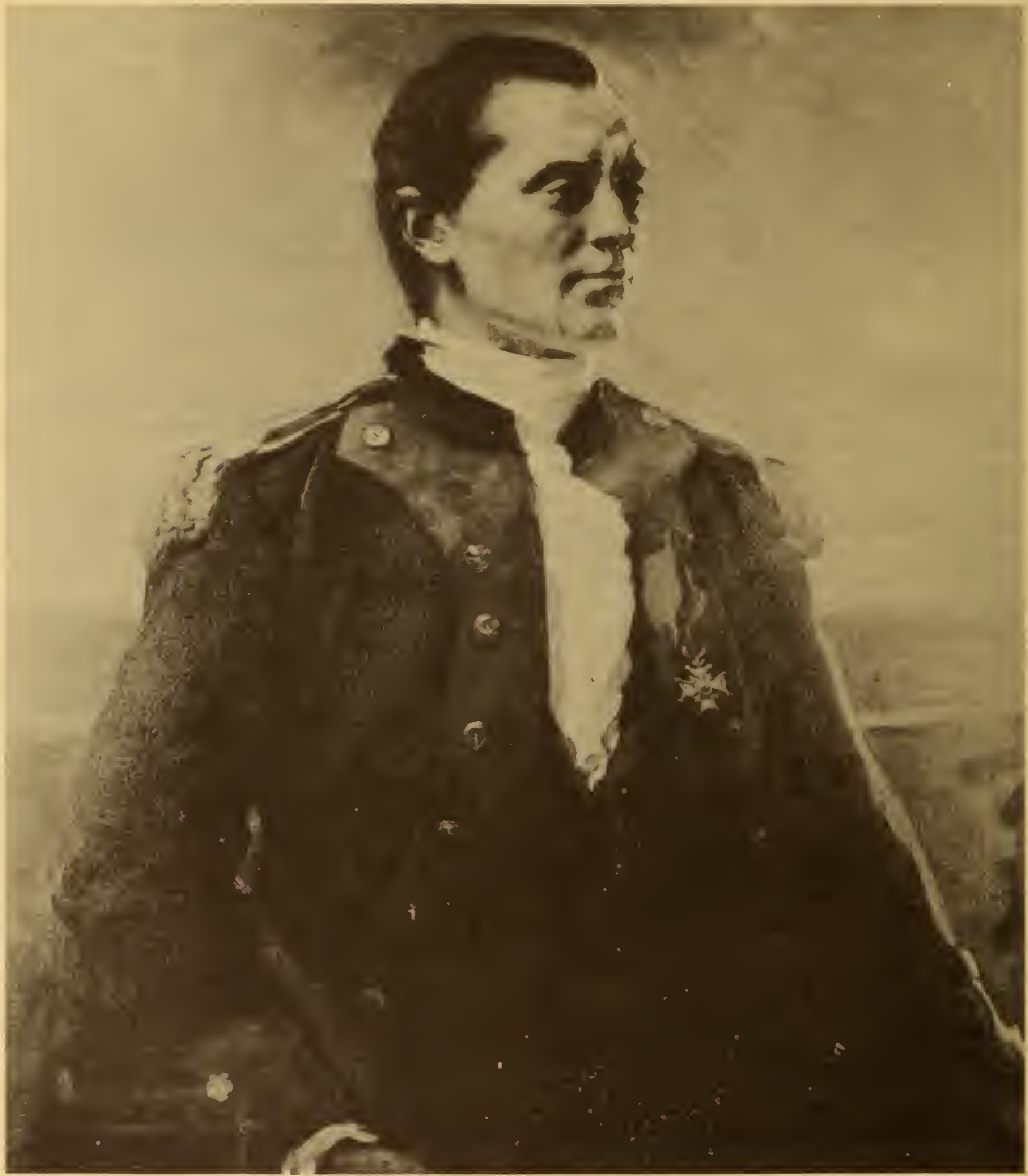
Jones's victories were not accidents. In moments of stress, he mingled with his crew, cheered them on. They thrilled to serve under such a leader and sang as they worked. As Jones said, "I like my men and I know how to make them like me." A shipmate once said of Jones: "He was in everybody's watch, and everybody's mess all the time. In fact, I may say that any ship Paul Jones commanded was full of himself all the time."

And what did the British think of him? Captain Pearson at his court-martial made this amazing and illuminating statement about Jones:

> Although more than half the crew were French—at any rate not Americans—long before the close of the action it became apparent that the American ship was dominated by a commanding will of the most unalterable resolution, and there could be no doubt that the intention of her commander was, if he could not conquer, to sink alongside. And this desperate resolve was fully shared and fiercely seconded by every one of his ship's company. And if the Honorable Court may be pleased to enter an expression of opinion, I will venture to say that if French seamen can ever be induced by their own officers to fight in their own ships as Captain Jones induced them to fight in his American one, the future burdens of His Majesty's Navy will be heavier than they have heretofore been.

Lord Sandwich, first Lord of the British Admiralty, wrote to one of his commanders, "For God's sake get to sea immediately. If you take Paul Jones you will be as high in the estimation of the public as if you had beat the combined fleets." Such was the British evaluation of the founder of the American Navy.

Jones's great victory over the *Serapis* has become an inspiring example for all hands of the Naval Service. It is easy to understand why he is known as the founder of our highest traditions. In the 20th century, the boarding of enemy ships while under fire is not considered smart tactics because of airplanes and the



FATHER OF OUR HIGHEST NAVAL TRADITIONS
John Paul Jones represents the seaman, leader, officer, and gentleman at his best.

increased range of naval guns. But the indomitable courage and readiness to fight to the very end remain as prominent in the make-up of the American fighting man today as it was in the days of John Paul Jones.

This sailor of fortune was born in Scotland in 1747. As a youth, he served several years as midshipman in the British Navy and studied both seamanship and English by the forecastle lamp. A master of English prose and a gentleman, he set the tone and traditions of our own Service. His concept of an American naval officer is evident in his statement, "None other than a gentleman as well as a seaman both in theory and practice is qualified to support the character of a commissioned officer in the navy nor is any man fit to command a ship of war who is not also capable of communicating his ideas on paper, in language that becomes his rank."

His attitude on peace and war appears frequently in his writings: "In time of peace it is necessary to prepare, and be always prepared for war at sea." However, he added, "I have always regarded war as the scourge of the human race."

WAR WITH FRANCE

Transitional Period

After the Revolutionary War, the fortunes of the Navy declined and by 1785 its last ship had been sold. Little remained except fighting traditions. When the new Federal Constitution went into effect in 1789, the War Department was charged with both the Army and the Navy, a burden then consisting of a few hundred soldiers—and no ships or marines.

This absence of naval strength soon proved disastrous because the Algerian pirates began capturing our merchant ships and imprisoning their crews. In 1794 public sentiment moved Congress to authorize the building of six frigates to protect our interests. Here was the beginning of the permanent Navy of the United States.

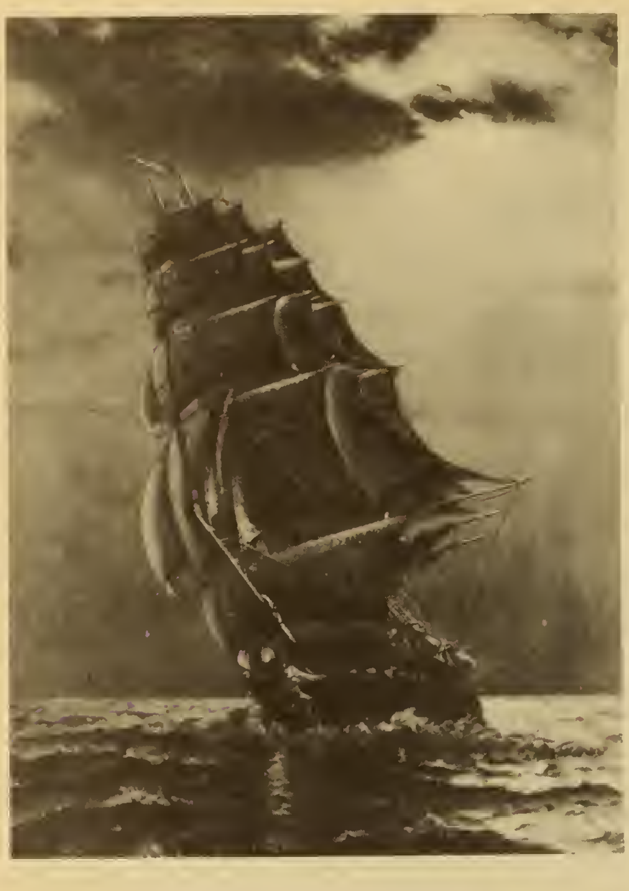
Joshua Humphreys. Fortunately, President Washington allocated the task of designing these ships to Joshua Humphreys, a Philadelphia Quaker who thus became our first naval constructor. Not only a technical genius, Humphreys was also a farseeing student of naval history and exerted a tremendous influence upon the American Navy. He believed that our "vessels should combine such qualities of strength, durability, swiftness of sailing, and force, as to render them superior to any frigate belonging to the European Powers." He departed from conventional standards and designed the best frigates that sailed the seas—frigates that could run or fight at will, frigates that could fight on their own terms. The chief innovations were provisions for heavier batteries, thicker timber, finer lines, and longer, stouter spars than those of frigates of other powers. Several years later the Royal Navy paid a compliment to Humphrey's skill by constructing frigates according to his designs.

Humphreys drew up plans for the six famous frigates, the *United States, Constitution, Constellation, President, Chesapeake,* and *Congress.* Two of these ships, the *Constitution* and the *Constellation* are still afloat.

The great tradition founded by Humphreys and sanctioned by President Washington was that American ships should be larger, stronger, faster, and heavier gunned than those of other nations. Humphreys broke sharply with current naval ideas and initiated a custom tremendously valuable to any nation—a friendliness to innovation, a willingness to experiment.

Opening Hostilities

Enemies other than the Barbary pirates soon harassed the defenseless United States, for both France and England, then in a death struggle, began to plunder American merchantmen. While a treaty in 1795 with Great Britain relieved the friction with that country, our relations grew worse with France, who charged us with treaty violation. Captures continued and when French privateers began operating in American harbors, even the patient Congress was aroused and decided to take immediate and vigorous action.



NEW AND RADICAL—IN ITS DAY
USS *Constitution*, built for speed and fire power, helped to rid the Mediterranean of the Barbary pirates.

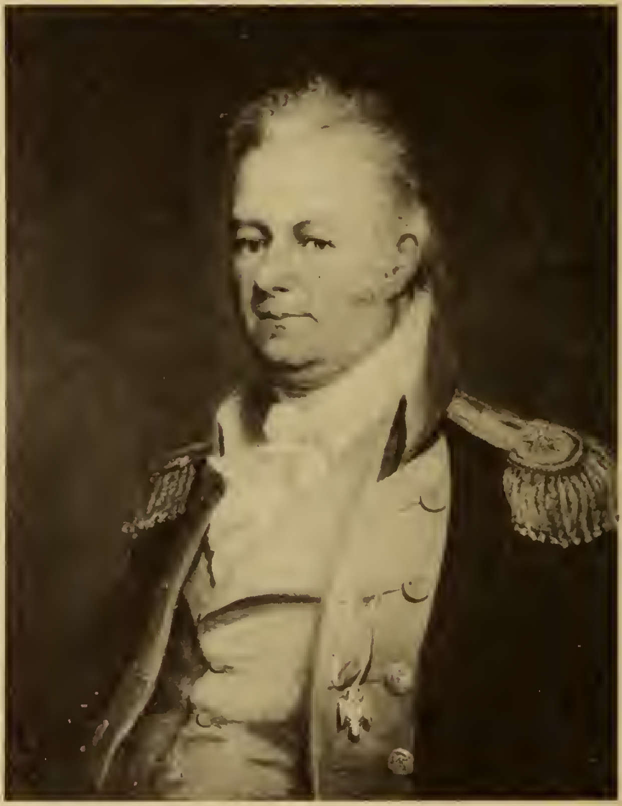
The Navy Department was established (1798) and Benjamin Stoddert of Georgetown, Maryland, was appointed the first Secretary of the Navy. Again, as in the Revolutionary War, a navy had to be created with war already in progress. Our small Navy, therefore, was immediately expanded; numerous naval officers were appointed for active duty; recruiting offices in the principal ports along the Atlantic coast put on a drive for seamen. British discipline, regulations, and traditions were adopted for Americans. The Marine Corps was formally organized. Although no actual declaration of war was made, Congress authorized the Navy to retaliate and to seize armed French vessels within the jurisdictional limits of the United States or on the high seas. The quasi-war with France was on.

The undeclared war with France lasted two years and was fought entirely on the sea, mainly in the Caribbean. Since France was still at war with Great Britain, only French privateers and a few French cruisers were available for action on this side of the Atlantic. The American forces won many victories, some of them rather spectacular, against superior forces. Finally, our naval vessels and privateers raised such havoc with French naval and merchant ships that France agreed to a peace treaty early in 1801.

Thomas Truxtun

"Care for your men; see that each understands his duties; exact instant obedience; superintend everything; practice daily with the guns."

This simple formula for victory over an enemy fleet was devised by Thomas Truxtun, the outstanding officer in the war with France. An expert seaman and a strict disciplinarian, Captain Truxtun was one



"TAKE CARE OF YOUR MEN"
Although Captain Truxtun insisted on absolute obedience, he also insisted on justice and consideration for enlisted personnel.

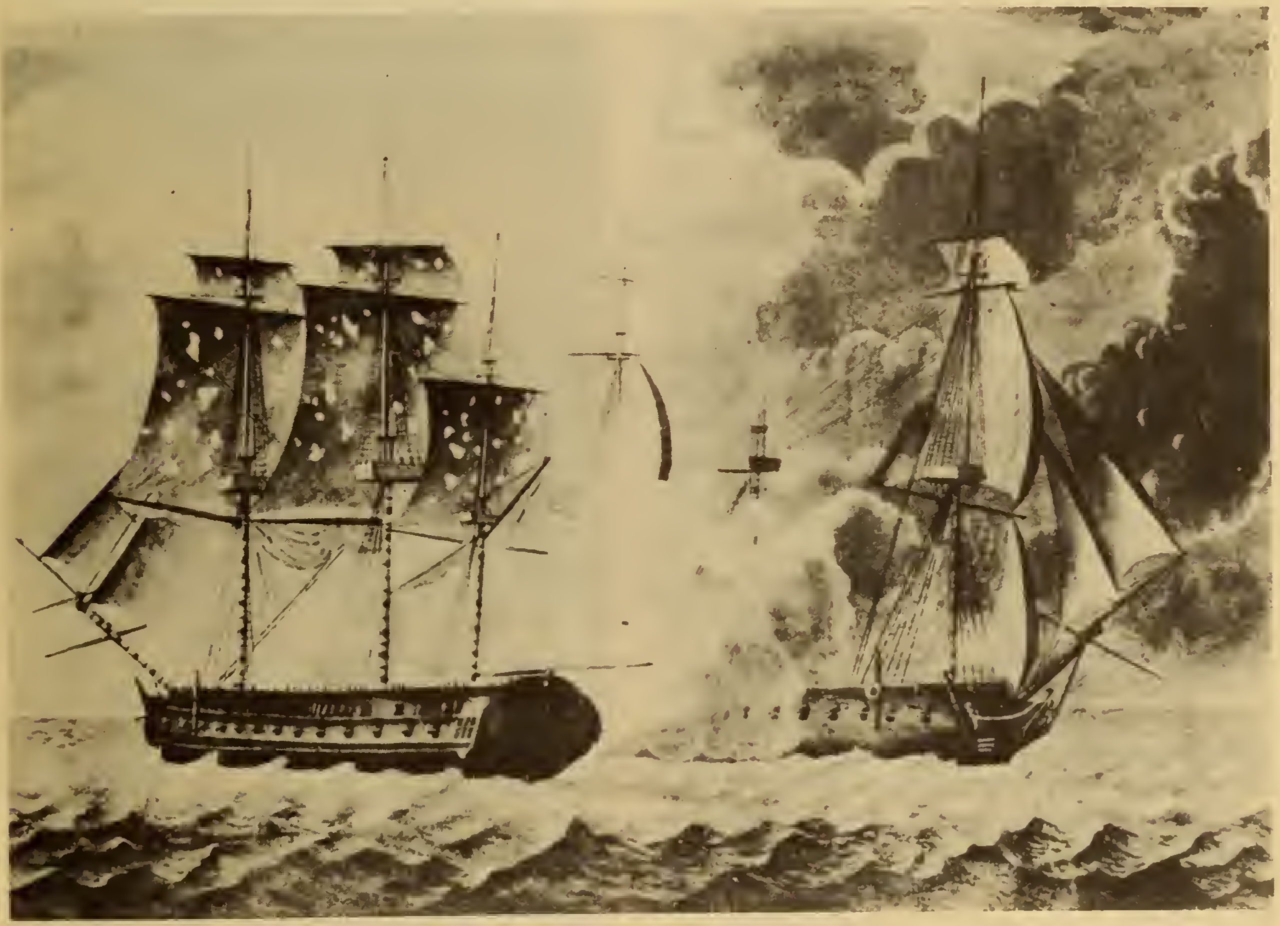
of the first to work out a basic philosophy on the relations of officers and men that still is applicable today.

Although his fame is derived principally from the two smashing victories that he attained over the French, emphasis should be placed on the examples he set in the handling of men. The bluejackets who today look up to their officers, and the officers who interest themselves in the well-being and work of their men are following the practices initiated by Captain Truxtun. One hundred and fifty years ago when enlisted men were often punished savagely and without justice—and looked upon as fighting mechanisms rather than as human beings—he insisted that his officers treat their men courteously but firmly and that the men respect and obey their officers.

In language which could not be misunderstood, Captain Truxtun wrote:

> It is not to be expected that the Lieutenants of Ship are to remain idle and indifferent spectators of what is going on, but on the contrary it is absolutely necessary that they overlook the duty of every department on board.
>
> An officer in carrying on his duty should be civil and polite to everyone, for civility does not interfere with discipline.
>
> An officer is never to lose sight of that humanity and care that is due to those who may really be sick or otherwise stand in need of his assistance.

Truxtun's attitude toward his men developed as a result of his experiences during the Revolutionary War when he was a successful privateer captain working closely with the Navy. He could not help noticing



NO RANGE FINDER NEEDED IN THIS SLUGGING MATCH
The *Constellation*, under Truxtun, defeated the French *Insurgente* in 1799. Strict—but fair—discipline and daily gun practice were partly responsible for the ship's efficiency in battle.

and regretting that many naval officers, slack and indolent, cared too little about a taut ship. As captain of the *Constellation* during the war with France in 1799, he defeated the *Insurgente* and the *Vengeance* and found here an opportunity to instill his own martial spirit in his men.

While fighting the *Insurgente*, one of Captain Truxtun's officers, acting under orders, stabbed to death one of his own men because he left his post during the shooting, thus endangering the lives of all. This incident exemplifies the strict discipline insisted on by Truxtun. The desertion was particularly unforgivable because the fighting was not fierce: the Americans had suffered only four casualties and three of these recovered.

Furthermore, after the enemy had opened fire, Captain Truxtun ordered his officers not to "throw away a single charge of powder and shot but to take good aim and to fire directly into the hull of the enemy . . . to encourage the men at their quarters and to cause or suffer no noise or confusion whatever but to load and fire as fast as possible when it could be done with certain effect."

The battle against the *Vengeance*, fought at night, began at 2000 and lasted until 0100. In it, a teenaged boy, a midshipmen, lived up to what the Navy today calls "The highest traditions of the Naval Service." When a sailor told Midshipman Jarvis that the mainmast was tottering and that he should come down before he be killed, Jarvis replied, "If the mast goes, we go with it. Our post is here."

The next roll of the ship sent the mast crashing and splintering over the side and threw Jarvis to his death far out into the black water. In tribute to the courage and magnificent discipline that characterized this boy's act, Congress passed the following resolution: "The conduct of James Jarvis, a midshipman of the *Constellation*, who gloriously preferred certain death to the abandonment of his post deserves the highest praise; and the loss of so promising an officer is a subject of national regret."

WAR WITH TRIPOLI

Cause of the War

Tempted by the lure of unprotected American commerce and dissatisfied with the small tributes the United States was paying under the terms of an earlier treaty, the Dey of Tripoli in 1801 declared war on the United States by cutting down the flagstaff of the American consulate. Immediately he dispatched his cruisers against American shipping.

Soon after the war broke out, Commodore Edward Preble in the *Constitution* was sent to the Mediterranean in command of a squadron. An incident that occurred at Gibraltar both delighted and thrilled Preble's young officers. During heavy weather another ship was encountered and each was eager to learn the other's identity without committing herself. After a short interval, Preble shouted: "I now hail for the last time. If you do not answer I'll fire a shot."

"If you do I'll answer with a broadside," retorted the unknown.

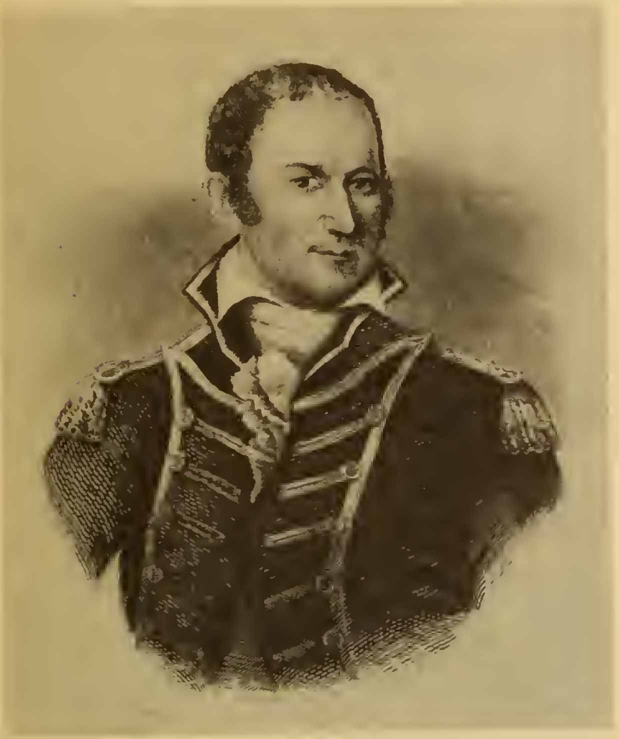
"I should like to see you try that! I now hail for an answer; what ship is that?"

"This is his Britannic Majesty's 84-gun ship *Donegal*, Sir Richard Strochan. Send a boat aboard."

"This is the United States frigate *Constitution*, 44, Captain Edward Preble, and I'll be damned if I'll send a boat aboard any ship. Blow your matches, boys."

A little later it was the Englishman who sent the boat, and his ship turned out to be only a 32-gun frigate. It was plain that no force or threat of force could overawe Preble; and that was the example he gave his young officers.

During the war with the pirates in the Mediterranean, two dramatic incidents occurred which were influential in molding the traditions of our youthful Navy. The frigate *Philadelphia* had fallen into the hands of Tripolitans and was now an important addition to their harbor defenses. It was young Lieutenant Stephen Decatur who went to Commodore Preble and volunteered to destroy this noble frigate, built by popular subscription in his home city and first commanded by his father. He, with 74 comrades, including Charles Morris, James Lawrence, and Thomas Mac-



"TAKE CARE OF YOUR OFFICERS"
The training that Captain Edward Preble gave his "boys" in fighting the Mediterranean pirates paid dividends in the War of 1812 when they achieved 17 out of a total of 18 victories on the seas.

donough, stealthily entered the harbor at night in a small ketch. Within a few minutes they had complete possession of the ship, the foe having been cut down or driven into the sea. Combustibles were passed aboard, and soon the ship was burning fiercely. Several minutes later the boarders, with but one man wounded, were back in their ketch and, under fire from shore batteries, they left the illuminated harbor.

Perhaps no act in the first half of the 19th century thrilled Americans more than the destruction of the *Philadelphia*. This spectacular feat made Decatur the most striking figure of the time and prompted Admiral Nelson to call it "the most daring act of the age." Decatur was said to be more universally beloved during his lifetime than any other American naval hero. He showed extraordinary talent as a military man, as a diplomat, and as an administrator. His personal gallantry and chivalrous spirit gave to our Navy a heroic tone which has come down through the years as an heritage of inestimable value.

Equally heroic, although tragic, was a second incident in the Mediterranean War. Commodore Preble decided to send the frigate *Intrepid*, fitted up as a floating mine, into a Tripolitan harbor and to explode it there, thus destroying the ships and defenses of the town. Captain Richard Somers volunteered to lead the expedition. Fuses were installed and were expected to burn fifteen minutes before igniting the explosives, thus giving the men time to escape in two small boats. No illusions existed as to the danger of the venture and the men disposed of their personal effects before setting out.

A terrible explosion reached the ears of those in the fleet and it occurred, unfortunately, before the party could have arrived at its objective. While no one knows exactly what happened, it seems evident that the "fire ship" was intercepted by the enemy. Rather than surrender themselves and their large stores of powder to the enemy, a match was probably thrown into the explosives and Somers with his gallant crew was blown into eternity. On deeds like these the traditions of our Navy are built.

Preble and His "Boys"

Commodore Preble was little known when sent into the Mediterranean, although he had fought as a lieutenant in the American Revolution and later in the war with France. He has often been called the true founder of the American Navy, for his squadron off Tripoli was a training school for most of the young officers who later distinguished themselves in the War of 1812. Indeed, in that war although less than one-third of the commands were entrusted to Preble "graduates," they scored 17 out of the 18 victories attained at sea.

Preble believed in Truxtun's ideas and expanded them. Having served during the Revolution, he, too, realized the need for tightening up the discipline in the Service. Like Truxtun, he was keenly interested in his bluejackets; their care and fair treatment absorbed his attention. Truxtun held himself aloof from his junior officers and discouraged any suggestions from them; Preble, on the other hand, tried to draw close to his officers and encouraged them to offer new ideas. He was generous in giving his subordinates due credit for achievements in the squadron and in urging promotions and honors for those who had earned them. The mutual regard between the Commodore and his young officers (all the captains and lieutenants were under thirty years of age) amounted to warm affection. The fleet was singularly united in spirit and through his leadership he became the idol of his officers and men. It is said that not a duel was fought in the squadron nor a court-martial ordered during his stay in the Mediterranean.

Preble taught his subordinates the necessity for absolute obedience, unyielding courage, and 24-hour-a-day efficiency which have continued to be the standards of the American Navy. "Preble's boys," as his officers liked to be called, were also beloved by their men, and this cordial relationship between officers and enlisted men has also become a distinguishing tradition of our Service.

WAR OF 1812

Our Navy's Golden Age

Although the Navy was outnumbered 40 to 1 in the second war with Great Britain and by 1814 had suffered severe reverses (our coast was tightly blockaded, our ships were driven from the high seas and our capital, Washington, had been burned), nevertheless, early in the war it fought a series of frigate and sloop-of-war duels that resulted in astounding victories and gained the Navy a world reputation. The reasons for these victories are not hard to find. We had the best frigates in the world—the tradition of Humphreys; we had the best gunnery in the world—the tradition of Truxtun; our morale was high—the tradition of Preble; and our Navy had a great fighting spirit—the tradition of John Paul Jones.

Strangely enough, although these brilliant frigate victories on the high seas had little effect on the course of the war itself, they contributed much to the building of traditions in our Navy.

John Rodgers. It was John Rodgers, heading a squadron, who started his cruise—and the war—by calling all hands to quarters and saying, "Now, lads, we have got something to do that will shake the rust from our jackets. War is declared. The rascals have been bullying over us these ten years, and I am glad the time has come when we can have satisfaction." In this vein, the war began.

Isaac Hull. Captain Isaac Hull, commanding the *Constitution*, gained first honors when he met the *Guerriere* under Captain Dacres. During the battle, Hull quietly moved among the officers and men, addressing to them words of confidence and encouragement. "Men, now do your duty," he would say. And every man stood firm to his post.

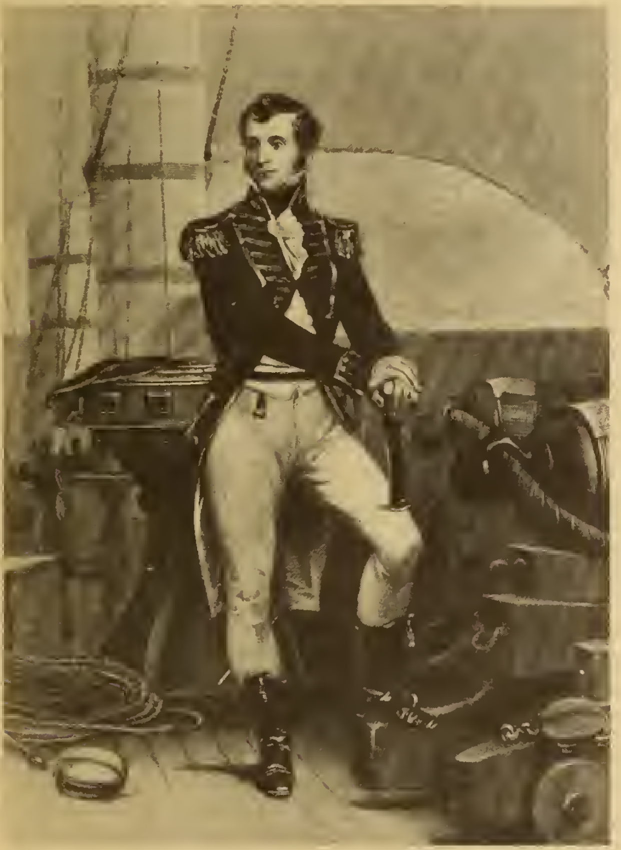
Within twenty minutes the *Guerriere* had been reduced to a wreck—a feat which astonished both sides of the Atlantic. "Dacres, give me your hand. I know you are hurt," said Captain Hull as he helped his old acquaintance aboard. When the gallant Dacres offered his sword, the victor refused it, saying, "No, I'll not take a sword from one who knows so well how to use it." It was in this battle that our most famous

STAUNCHEST SHIPS AFLOAT IN 1801
Six American frigates, like the *Constellation* shown above, represented new ideas in ship design and embodied great strength and fire power.

and historic ship, the *Constitution* received its new name "Old Ironsides."

Stephen Decatur. As already pointed out, Decatur received his training in Preble's rough school in the Mediterranean. Now in command of the *United States,* he faced the *Macedonian,* one of the finest ships of her class in the Royal Navy. Unlike the daredevil of Tripolitan days, Decatur, choosing his position well, decided to fight at long range and gradually wear down his opponent. As the battle neared and the *United States* readied herself for action, Decatur made a last inspection of his ship. As he moved among his sailors, they touched their caps to him, murmuring to one another expressions of the reverence with which they regarded this leader.

Quickly analyzing the battle situation, Decatur saw that the greater range of his guns would enable him to outshoot and cripple the British. He cleverly maneuvered his ship and prevented the enemy from closing in. His gunners fired rapidly and accurately, and more than a hundred shots penetrated the *Macedonian's* hull. Down came her mizzenmast, and both the fore and main topmasts were shot off. After two hours of fighting, the battle was over. The victory was a great exhibition of leadership by Decatur who possessed to an exceptional degree the ability to infuse his own spirit into his men. That spirit he describes as follows: "The enthusiasm of every officer, seaman, and marine on board this ship, on discovering the enemy, their steady conduct in battle, and precision of their fire, could not be surpassed."



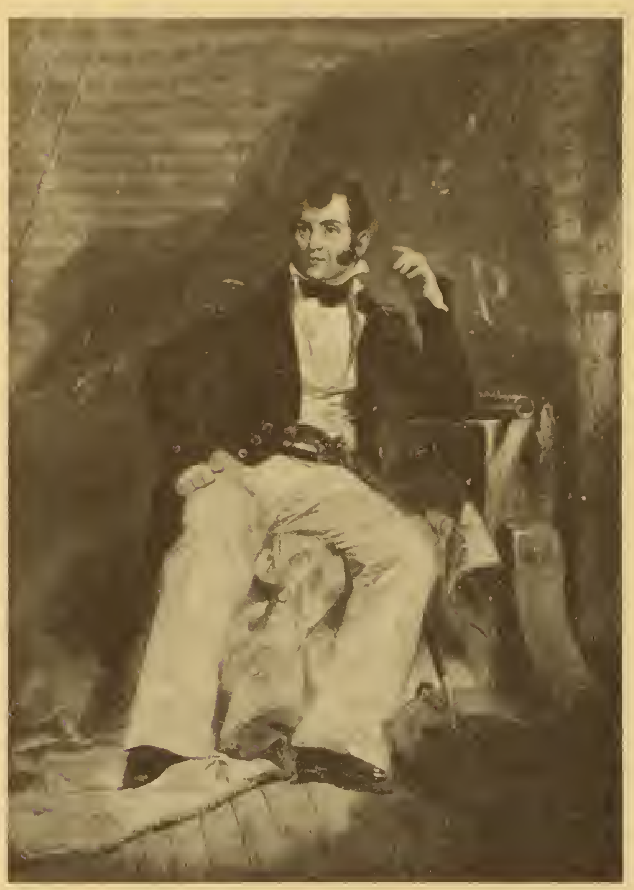
PRAISE CAN BE A MOTIVATING FORCE, TOO
Captain Stephen Decatur substituted praise for oaths and flogging —and his gunners poured 100 shots at long range into the enemy Macedonian in the War of 1812.

Decatur was popular with his men. He avoided oaths and flogging—the customary methods of gaining discipline at that time. He often addressed his men, explaining the kind of conduct that he expected of them. They obeyed him because they knew how great was his confidence in them.

William Bainbridge. Within a short time, Commodore Bainbridge took command of "Old Ironsides" and gained a victory over the *Java* in what was probably the fiercest frigate action of the war. Bainbridge, badly wounded early in the fight, refused to leave his station on deck until the *Java* struck her colors.

This was an era when fighting slogans were coined, such as James Lawrence's dying words uttered in the ill-fated *Chesapeake.* "Fight her till she sinks and don't give up the ship." His dying words became the battle cry of the Golden Age. Perry carried them to Lake Erie where he hoisted on his ship (named in honor of Lawrence) the flag upon which were stitched the words, "Don't give up the ship."

Oliver Hazard Perry. Soon after the defeat of the *Chesapeake,* the famous battle of Lake Erie was fought. During the first phases, Perry, with four-fifths of his crew dead or wounded and his ship, the *Lawrence,* crippled, faced defeat. At this critical moment, he made his famous passage in an open boat to another ship, the *Niagara,* which had not yet entered the fight. Using a surprise maneuver, he sailed the *Niagara* aggressively through the enemy's lines and within fifteen minutes the battle was won—an exhibition of extraordinary energy, ingenuity, and fiery courage. According to the newly established custom Perry re-



APOSTLE OF PREPARATION AND METHOD
Oliver Perry represents the Americon tradition of energetic planning and equipment that is adequate for the job to be done.

turned the swords of the British captains in recognition of their brilliance and gallantry. Then, on the back of an old letter, using his cap for support, he penciled his famous dispatch: "We have met the enemy and they are ours."

Perry really won the battle of Lake Erie in the months before he faced the fire of the British fleet. It was during those discouraging and hopeless days when he was working in spite of sickness and hardship to build, equip, and man a stronger fleet than the enemy's that his real leadership was displayed. He used sound judgment and foresight in his preparations. The night before the battle he went over his plans of attack repeatedly with his officers until he was convinced that each knew the part he was to play. It was his preparation and forehandedness rather than his dramatic crossing of the line of fire in an open boat that place him in the forefront of our tradition-makers.

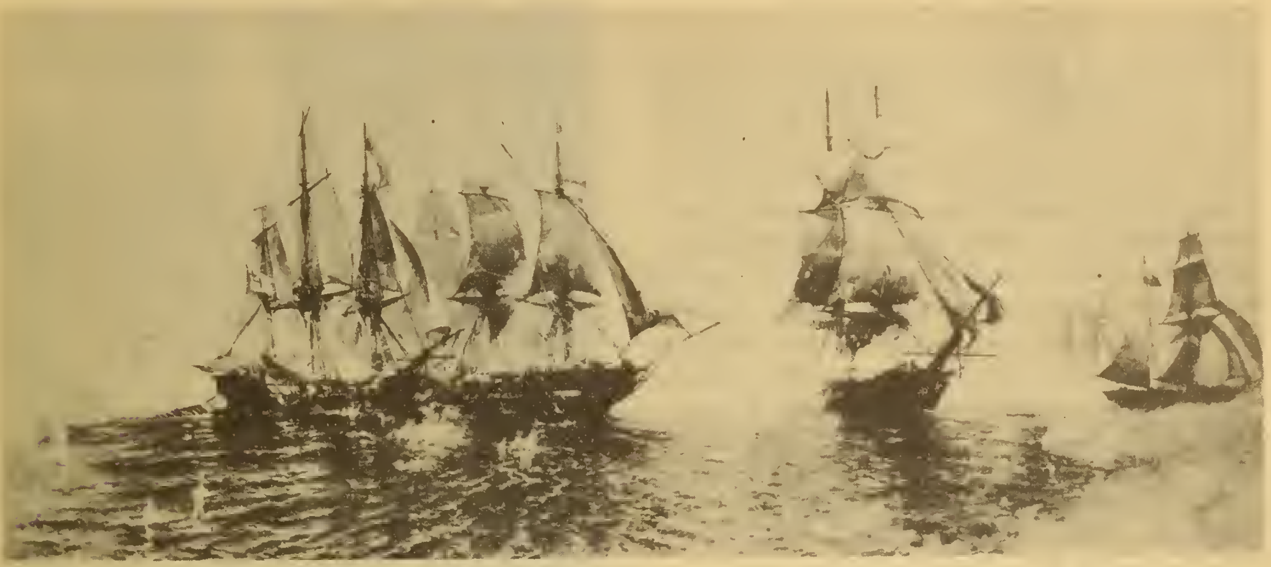
Dr. Usher Parsons. Quite as much a hero and tradition-maker but seldom mentioned in descriptions of the battle of Lake Erie was Dr. Usher Parsons, the only surgeon available for duty during the fight. Several days before the battle, Parsons had been so ill that he could not walk and had himself carried from ship to ship on a cot from which he ministered to the sick who were brought on deck for his inspection.

During the battle Dr. Parsons served under Perry on board the flagship. Since this ship was shallow built and had no protected cockpit, as was customary, the Doctor received the wounded on the wardroom floor which was nearly level with the surface of the water. Here, in this unprotected, crowded spot, Parsons and his assistants carried on their work. He said that in the main, since the wounded were being "passed down to me faster than I could attend to them in a proper manner—I aimed only to save life during the action by tieing arteries or applying tourniquets to prevent fatal hemorrhage and sometimes applying splints as a temporary support to shattered limbs." Perry's manpower was fast being depleted during the battle and on five occasions he called down to the Doctor to release one of his assistants in order that he could fight on deck. Finally, Dr. Parsons was left to work alone among the dead and dying.

During the battle five cannon balls crashed through the wardroom, one of them killing two men lying on the operating table. In all, Dr. Parsons amputated six limbs and dressed the wounds of many men before he finally transferred with Perry to the *Niagara.*

Of the 96 men wounded in the battle, only 3 died—a remarkable tribute to the skill of the 25-year-old surgeon's mate. After 42 hours of continuous duty the Doctor retired to his cot. In a letter to the Secretary of the Navy, Perry wrote: "Of Doctor Parsons, surgeon's mate, I cannot say too much." But Dr. Parsons was only one of many other doctors who were building naval tradition, for during the short war with France and during the War of 1812, the names of 34 medical officers were mentioned in resolutions of Congress.

Thomas Macdonough. Of perhaps greater impor-



SURPRISE AMERICAN MANEUVER TURNS DEFEAT INTO VICTORY
With nearly all the crew dead or wounded and the ship crippled, Perry broke the British line with the *Niagara* (shown right of center) and attained victory in 15 minutes.

tance than Perry's victory was Thomas Macdonough's brilliant triumph over the British fleet on Lake Champlain. As the enemy ships stood in, "young Macdonough, who feared his foes not at all, but his God a great deal, knelt for a moment, with his officers on the quarterdeck."

Macdonough was everywhere during the battle, trying to instill organization and fighting spirit into his comparatively new crew. His calm determination was remarkably contagious. Twice he was knocked senseless. Without taking away any of the glory that belongs to those other brave men who fought on the American side, it is not too much to say that the credit of this victory against a superior force belongs first and last to Macdonough himself. The victory was due to his skill in choosing a position that imposed upon the British an approach under a raking fire, and to his shrewd forethought in providing for exactly what occurred. The ships were at anchor during the battle and it was the "springs" on his cables that allowed him to swing his ships at the proper time and expose to the enemy undamaged broadsides that turned defeat into victory. His foresightedness and sound judgment combined with the finest kind of courage place Thomas Macdonough at the head of our list of heroes in 1812. According to one historian, "Down to the time of the Civil War he is the greatest figure in our naval history."

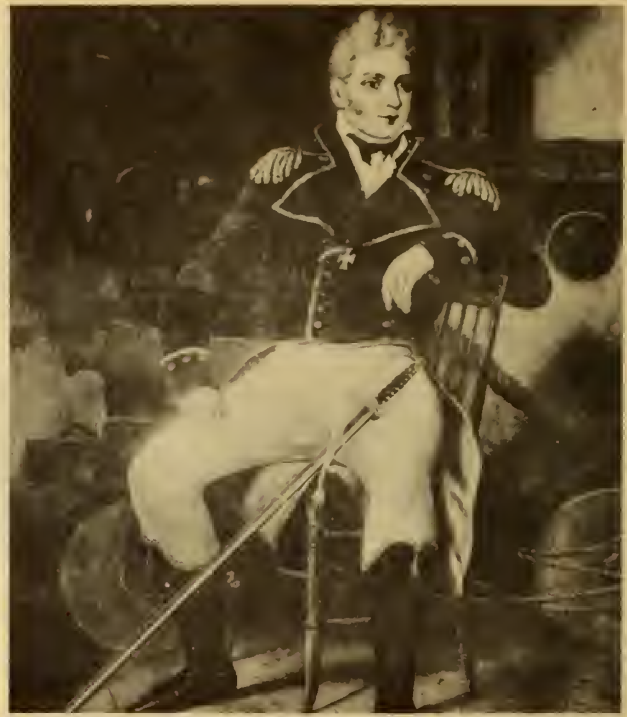
After the battle, this pious officer sent the following dispatch to the Secretary of the Navy: "The Almighty has been pleased to grant us a signal victory on Lake Champlain in the capture of one frigate, one brig and two sloops-of-war of the enemy." Following Perry's example, officers under Macdonough treated the prisoners with elaborate courtesy. Courtesy to the defeated has become one of our outstanding naval traditions, for rarely have we won a victory where our prisoners have not testified to the generous treatment they have received.

The strategic importance of the victory at Lake Champlain was like that at Lake Erie in that it ended the British invasion and affected favorably our peace negotiations at Ghent.

William Burrows. Another illustration of the intrepid spirit of the gallant sea warriors of 1812 is exemplified in the conduct of Captain Burrows of the *Enterprise.* Mortally wounded in an action with the *Boxer,* he lay on the quarterdeck, refusing to leave, and ordered his men to fight on. "Never strike the flag," he cried in agony, and another thrilling slogan was added to the Navy's record! Just before his death, this courageous officer received news of the victory, whereupon he whispered, "I am satisfied, I die contented."

The power of the ideals that men fight for must never be underestimated. It has been a general rule that naval golden ages are marked by a fervent belief in the causes for which men fight. This was true in the War of 1812. It was a willingness to risk all in defense of the principles upon which the new republic had been founded that spurred an infant Navy to face fearlessly the world's largest and most experienced sea power. Before going into action a captain customarily mustered his crew aft and made a patriotic speech. Often the men gave three hearty cheers spontaneously when swinging alongside the enemy. Nor was it unusual for them after a stroke of good fortune during battle to stop fighting momentarily and cheer lustily. Perhaps the chief characteristics of the heroes of the Golden Age were enthusiasm, loyalty, and the will to win.

Although overwhelmed by the greatest naval power in the world, our little makeshift Navy fought valiantly. It was a brilliant example of putting into practice the Navy's slogan in World War II: Do the best you can with what you have.



HUMBLE BEFORE GOD AND GENTLE TO PRISONERS
Captain Thomas Macdonough began battle with prayer and ended by treating conquered enemy with courtesy.

THE NAVY FROM 1815 TO 1860

Interval of Peace

From 1815 until the Civil War this country enjoyed a long period of peace, interrupted only by the short-lived Mexican War. During this interval, there was inaugurated the practice of dividing the Navy's cruising vessels into several squadrons, assigned to particular geographic areas in the Atlantic and elsewhere. It served as a means of policing certain seas overrun with pirates, suppressing the slave trade, and protecting and promoting sea trade throughout the world. Each ship was considered a potential solitary raider rather than a unit of a fighting fleet. Ships rarely engaged in maneuvers, even when in company.

Founding of the Naval Academy. An outstanding weakness of the Service in the early days was the lack of disciplinary training and naval indoctrination of its midshipmen. Although chaplains and schoolmasters aboard ships did what they could under difficult conditions and in spite of the fact that the early naval schools which functioned irregularly at the navy yards contributed some good teachers, nevertheless at best midshipmen received only rudimentary and haphazard instruction before 1845.

An incident which occurred at sea in 1842 shocked the nation and was to have far-reaching effect. In that year Midshipman Philip Spencer, son of the Secretary of War under President Tyler, and two seamen were hanged at the yardarm of the United States brig *Somers* for attempting a mutiny. This incident, which showed the need for more careful selection and training of naval personnel, no doubt hastened the founding of the United States Naval Academy at Annapolis, agitation for which had been going on for a number of years. It is probable, too, that the application of steam to warships and the need of teaching engineering to midshipmen, together with the threat of a war with Mexico, played their part in the founding of the Academy in 1845. The major credit for establishing this institution goes to Secretary of Navy George Bancroft, who had earlier distinguished himself as an educator, diplomat, and historian.

Regardless of the opinion of many old timers who laughed at the idea of "teaching sailors on shore," the institution was established under the direction of Commander Franklin Buchanan with 50 midshipmen and 7 instructors. Bancroft chose Buchanan, an officer of 30 years' service, because of his reputation for sobriety, strict attention to duty, thorough discipline, and general competence.

Time has proved this to have been an essential step toward producing a thoroughly competent officer corps. The Academy furthermore has, since its founding, nurtured a high degree of unity, general efficiency, and morale in the Navy.

Although the Naval Academy as it stands today bears little resemblance to its appearance in 1845—in fact, it has been completely rebuilt—nevertheless, to a midshipman, every building, every walk, every athletic field is brisk with the memories of what heroes in the Navy have done on shore, on water, and in the air.

Here in this institution, with its roots firmly established in "traditions of heroism and victory," almost 18,000 midshipmen have received their training in the first 100 years of its existence.

THE CIVIL WAR

Introduction

The naval history of the Civil War is a vivid portrayal of the employment of naval forces against an enemy without a fleet. Naval forces were a controlling factor in the Confederate defeat and in shortening the war. Although the Confederate States had no fleet, they were a consolidated land power with the advantage of interior lines, and they possessed several large sea and river ports affording access to world commerce which they vitally needed. This, however, was denied them by the effective Union blockade. The spectacular Confederate achievements were accomplished with extremely meager resources.

The Union Navy simultaneously assumed three huge strategic tasks, largely amphibious in nature. It attempted to blockade the whole southern coast, to force its way into various southern ports, and to cooperate with the Army on the western rivers—all undertaken in addition to its efforts to protect northern shipping from enemy raiders. A graphic illustration of the Navy's ability to adjust itself to new conditions may be found in the way in which, both afloat and ashore, it met the gigantic demands of the Civil War. To complicate matters for the rapidly expanding Service, the navies of the world were at that time in a transitional period, a veritable naval revolution. Although steam had been introduced some time earlier, armor was just coming into use. In the field of ordnance, moreover, rifled guns were just beginning to replace smoothbores.

The result of this rapid adjustment was one of the oddest assortments of warships ever assembled. The Union fleet contained old wooden frigates like the *Constitution*, several East River ferryboats, and a number of experimental ironclads of varied types. The South used armored vessels, steam commerce raiders, mines, and even a primitive submarine.

Under the excellent leadership of Secretary of Navy Gideon Welles, and his able assistant, Gustavus V. Fox, who was first to hold the newly created office of Assistant Secretary of Navy, the Naval Establishment rose magnificently to the occasion. The nation's scientists and inventors assisted the Navy with its problems and, for a period, the Americans led the way in the experiments of the naval revolution.

The most famous naval battle of the war was significant not so much because of its effect on the outcome of the war but as a preview of things to come. This was the famous battle between the Confederate's *Virginia* and the Union's *Monitor*. It has been said that probably no naval conflict in the history of the world attracted as much attention as did this one. It seemed to show at the time that wooden ships, which had long held control of the ocean, were to be of little or no further use for fighting purposes. The futility of the long and furious cannonade, contrasted with the outstanding victories of the *Virginia* over unarmored ships, such as the *Cumberland* and the *Congress*, on the previous day, made the battle a significant step in the development of the warship. It was the first conflict in which ironclad fought ironclad, and on that occasion armor proved superior to armament.

David G. Farragut

The outstanding hero of the Civil War was our first admiral, David G. Farragut (1801-1870). No officer in the Service has influenced his successors in so great a degree. Just as officers in the British Navy when facing great crises seek guidance in the exploits of Nelson, so American officers look to Farragut for stimulation and inspiration.

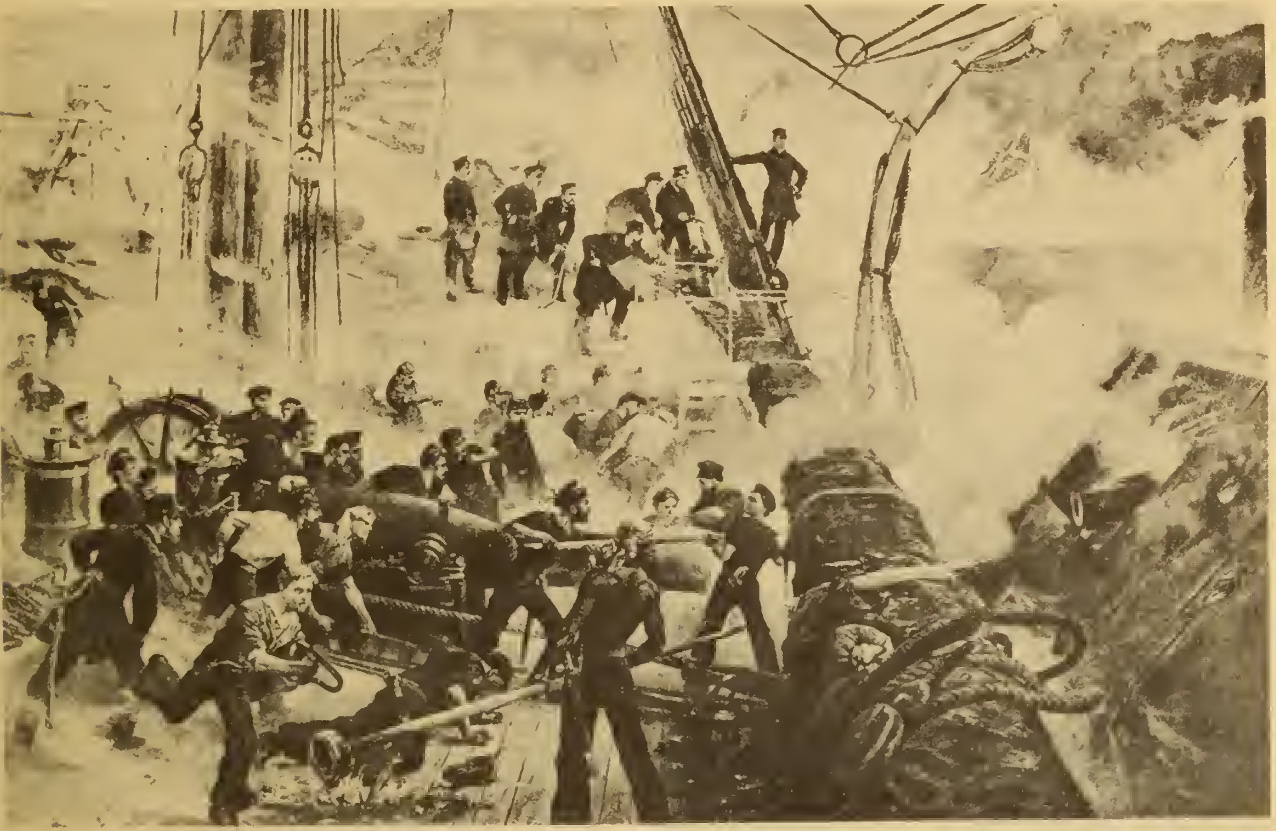
Like many others in the early days of the Navy, Farragut entered the Service when he was quite young. He was a midshipman before he was ten years old and had command of a ship (for a brief time) at the age of twelve.

Although Farragut was slight in stature, he had nevertheless in his swarthy face an expression of determination and power, imprinted perhaps during his early days on the sea when duty was a rough ordeal. The secret of his ability to command and to impress his will upon others was doubtless his inner strength, his deep moral character. He was a religious man and his religion influenced the pattern of his daily life. Officers found him approachable and those who served under him were drawn to him in a close personal relationship. It was with pride that they later boasted that they had served under this magnetic leader.

When the Civil War broke out in 1861, Farragut, then aged 60, had already served 49 years in the Navy and at this time was awaiting orders in Norfolk where he and his wife had made their home for almost 17 years. Meanwhile his southern friends, urging him to espouse the Confederate cause, greatly aroused his anger. Vehemently, Farragut shouted, "I would see every man of you damned before I would raise my hand against that flag." Thereupon, he was threatened with violence if he did not leave town immediately. "I'll be gone in two hours," he snapped.

NELSON IN ENGLAND—FARRAGUT IN AMERICA
The dominating figure of America's first admiral has left the imprint of his leadership and personality on our naval traditions.

Although at first suspected of being in sympathy with the South, Farragut, at the suggestion of his foster brother, Commander David D. Porter, soon was given command of a squadron with orders to capture New Orleans. Impressing all about him with his modesty, energy, confidence, and enthusiasm, Farragut accurately estimated the situation and showed deep strategic insight in his preparation for the attack. He reduced the forts guarding the city, and after several months of brilliant campaigning in which he proved his genius for planning and his knowledge of logistics, early in 1862 he won the first great naval victory of the war.



SMOKE IN THEIR NOSTRILS AND FIRE IN THEIR EYES
Farragut (standing with right hand on rigging) watches his gunners load and fire with all speed in the Battle of Mobile Bay.

Later, Farragut was placed in command of another expedition in the Gulf. It was at Mobile Bay that the incident occurred for which Farragut is best remembered. The Admiral was stationed on the *Hartford*, and during a critical phase of the battle, torpedoes (we call them mines today) were reported ahead. Farragut knew that the monitor *Tecumseh* with almost all hands had just gone down in that area. At this point, he shouted, "Damn the torpedoes! Full speed ahead!" and steamed through the waters where the *Tecumseh* had sunk. Mobile Bay had been forced! That he might command the engagement from the best vantage point and yet not be in danger of falling overboard if wounded, he lashed himself to the rigging.

The engagement affords another example of Farragut's genius for planning. He had spent two days making sure that his ships were prepared for the run. Heavy anchor cables were fastened alongside the wooden sides so as to make a sort of "chain armor" for the engines and boilers. To make sure that everything was just right he made an inspection of every ship on the afternoon before the attack. The battle shows Farragut's outstanding ability as a tactician as well as a strategist.

The entire expedition, planned with consummate care, had a Nelsonian touch. Never were Farragut's own words—"the best defense is a well-directed fire from your own guns"—better exemplified.

David D. Porter

David D. Porter was the son of the famous David Porter who commanded the raider *Essex* during the War of 1812. He saw more continuous fighting than any American naval officer of note during the Civil War—much of it on the Mississippi River. An officer of unusual energy and resourcefulness, Porter rose from the rank of lieutenant at the beginning of the conflict to that of rear admiral at its close. The following year he became a vice admiral, and four years later he reached the then supreme rank of Admiral of the Navy which only Farragut had enjoyed before him. He served four years (1865-1869) as Superintendent of the Naval Academy and his period of service there has been appropriately termed "an epoch-making administration."

It is not surprising that juniors were eager to serve under the energetic Porter. Besides being a fine seaman, skilled in ship handling, he possessed many personal traits that account to a great extent for the spectacular success of his naval career. He was impulsive, frank, and honest and was endowed with an abundance of common sense. His mind was able to grasp almost instantly the essential details of an operational plan. Situations never became so desperate that he could not find an opportunity for a jest. He was able to estimate accurately the potentialities of his subordinates and never failed to praise them when they lived up to his expectations. In him there was that combination of traits that has always characterized a great leader—practical skill, keen insight, and the ability to evaluate both men and situations quickly and accurately.

Franklin Buchanan

In the battle at Mobile Bay, as in others of this war, Americans met Americans—both nurtured on the same traditions. Facing Farragut on the Confederate *Tennessee* was Admiral Franklin Buchanan, who had served 46 years in the United States Navy. Buchanan had been the first Superintendent of the Naval Academy and the founder of its traditions. As Commanding Officer of Matthew Perry's flagship he was the first to land officially in Japan. When the Civil War broke out, he sided with the Confederacy. He was the first to command an ironclad (the *Virginia*) in battle, and finally rose to the highest naval rank in the Confederacy. There is a familiar ring in the words that this courageous, magnetic leader delivered to his crew before the battle: "If I fall, lay me on one side and go on with the fight, and never mind me, but whip and sink the Yankees, or fight until you sink yourself."

CRITICAL YEARS FOR THE NAVY

Period of Decline

Following the Civil War, the United States Navy entered a period of decline which lasted until 1883. The reasons for this decline were varied. The people of the United States, weary of war losses and expenses, were apathetic to the interests of the Navy. Railway building and westward expansion absorbed their energies. In addition, the merchant marine, the protection of which seemed to be the main purpose of the Navy, declined rapidly in the years following the Civil War. The safety afforded by our geographical isolation seemed to many people to make a navy unnecessary.

The situation in our Service was summarized by an English journal in 1876: "There never was such a hopeless, broken-down, tattered, forlorn apology for a navy as that possessed by the United States." The shadow of neglect well-nigh obliterated the once powerful Navy as it rotted away in the shipyards. Despite the fact that the Civil War had demonstrated the advantage of steam propulsion, when the war was over the Navy went back to sail. Also it did not heed the revolution taking place in armament, armor, and naval architecture. Admiral David D. Porter, utterly discouraged in 1881, said, "There is not a Navy that does not have the advantage of us in ships and guns." The Navy had not been so weak since the time when our country was compelled to pay ransom to the Barbary pirates.

Turning Point—1883

The turning point came in 1883 when Congress authorized four modern steel ships. These were the nucleus of the "new Navy." Expansion followed rapidly and the new ships incorporated most of the technical improvements to date. Many ships, mostly cruisers, were laid down before 1890, but no first-class battleships were authorized until that year. It must be emphasized that since 1815 the framers of American naval policy had proceeded on the assumption that commerce raiding and passive coast defense were the Navy's basic functions in war. As the 'eighties witnessed the beginning of the "new Navy," so the 'nineties are to be remembered as the beginning of a new naval policy that stemmed from the teachings and writings of Commander (later Admiral) Alfred Thayer Mahan.

Before considering the Spanish-American War, it would be well to pause and evaluate the contributions made by several outstanding peacetime heroes during the 19th century. Mahan is included in this group.

PEACETIME HEROES

Matthew Fontaine Maury

Many officers not noted as war heroes have served their nation and their Navy with distinction. These have been peacetime heroes and they too have added breadth and depth to the great current of tradition.

Chief among these peacetime contributors was Matthew Fontaine Maury. In the field of science, no officer in the 19th century rendered a service equal to this "Pathfinder of the Seas."

Starting as a midshipman in 1825, Maury served a number of years at sea. During this period he was shocked to learn that practically no helpful information was available to the mariner on such matters as winds, currents, best courses, and so on. In 1839, Maury sustained an injury which rendered him unfit for further sea duty. Heartbroken over this misfortune, he wisely turned his talents to science.

When he was in his early forties, the Navy Department appointed him Superintendent of the Depot of Charts and Instruments in Washington. He soon conceived the unique idea of collating available data found in the numberless old log books stored in the Navy Department. These he supplemented with observations made several times daily by ships in our Navy as well as by American and foreign merchant ships. Soon more than 1,000 shipmasters in every ocean were making day and night observations according to a uniform plan. The temperature of air and water, direction of wind, set of currents, and height of barometer were recorded. Navigators were instructed to cast overboard at stated periods bottles containing a record of ship's latitude, longitude, and date. They were requested to pick up similar bottles wherever found, noting the exact position and time, and to forward these data to Washington. On the basis of this information, Maury drew important conclusions about winds and currents, paths of storms, quickest routes between great shipping ports, and other fundamentals of modern navigation. To this day, Maury's pilot charts, brought up to date, are indispensable in making ocean travel safe and expeditious.

In 1844, he centered attention on the little-known Gulf Stream, then termed the "river in the ocean." Furthermore, he outlined the original system of naval education adopted by the Naval Academy. So helpful

HE CHARTED THE OCEANS
Maury learned secrets of tides, reefs, currents, and storms, and in his charts made this information available to navigators.

was Maury in the work of laying the Atlantic cable that Cyrus W. Field said, "Maury furnished the brains, England gave the money, and I did the work." His interests extended to mineralogy, geology, astronomy, exploration, and many other fields. His conception of the range of interests that a navy should embrace is found in his own words: "Navies are not all for war; peace has its conquests, science its glories; and no Navy can boast of brighter chaplets than those which have gathered in the fields of geographical exploration and physical research."

Though he always worked against great opposition, it is probably not an exaggeration to say that Maury organized almost the entire Navy for scientific research. Maury's philosophy may be summed up in his own words: "When principle is involved, be deaf to expediency."

When Virginia seceded from the Union, Maury was a commander in the Navy. Even though he was an antislavery man, he resigned his commission and cast his lot with his native state. He became the organizer of the South's naval defenses. He mined the James River, using the first floating mines of the war, aided in outfitting the famous ironclad *Virginia*, and was then sent to England to purchase materials. After the war ended, he taught at Virginia Military Institute.

Maury's contribution gave impetus and direction to the Navy's collateral work during times of peace. It has been followed by continuous effort in exploration, oceanography, astronomy, and other fields. Greeley, Peary, and Byrd pursued discovery until the American flag was planted at both poles by men of the Naval Service. The Hydrographic Office has continued with navigational and astronomical studies, and the distribution of its publications. *Bowditch* has been extended through many editions by the United States Navy. *The Nautical Almanac* was prepared in a Navy office. *The Air Almanac*, *Pilot Charts*, and *H.O. 214* all furnish evidence of the Navy's continuing interest in the safety, ease, and comfort of all hands at sea.

John A. Dahlgren

HE REFORMED GUNNERY
Dahlgren's improvements in ordnance increased the Navy's striking power. He is often referred to as the father of modern ordnance and gunnery.

Another officer whose greatest contribution was made in peacetime (in the main before the Civil War) was John A. Dahlgren (1809-1870), often called the father of modern ordnance and gunnery. Born in Philadelphia, son of a Swedish merchant and consular officer. Dahlgren at an early age demonstrated marked capacity as a mathematician, linguist, and historian.

After gaining some sea experience, Dahlgren entered the Navy in 1826 as a midshipman. He was plagued with ill health, particularly in his early years (for a time he was threatened with total blindness), but nevertheless he wrote many books and articles and contributed numerous inventions to the field of ordnance. Dahlgren's naval duties before the Civil War included, besides his sea duty, heading the Bureau of Ordnance in Washington, instructing in gunnery at Annapolis, and commanding the Washington Navy Yard. He was successful in renovating naval ordnance and established a regular system of ordnance workshops, gun-carriage shops, a cannon foundry, and an experimental laboratory.

Against strong protest from the Service, he persisted in introducing reforms. It was he who contributed the first big guns (9 inch and 15 inch), advocated the first real sights, and urged the rifling of cannon. Indirectly, he was partially responsible for the construction of ironclads. The Dahlgren gun was the most widely used type in the Union fleet during the Civil War. The Union victory in the war was due as much to John A. Dahlgren as to any other military figure. An account in a London paper of the *Kearsarge-Alabama* duel said that it was a "contest for superiority between the ordnance of Europe and America" in which the Dahlgren guns of the *Kearsarge* showed marked superiority.

A scientist and an inventor, an officer of genius and unusual force, Dahlgren finally succeeded in arousing the Service from its lethargy. His career was not a romantic story, nor was he a popular hero, but his enthusiasm and his love for the Navy have rarely been surpassed. He, too, created tradition. During his last hours, his mind reverted to his beloved naval profession and he said softly, "The officer should wear his uniform, as the judge his ermine, without a stain." This observation could be applied to few more fittingly than to Dahlgren himself.

Two noble monuments bear his name—Dahlgren Hall, which is the ordnance and gunnery building at the United States Naval Academy, and the Naval Proving Ground at Dahlgren, Virginia.

Stephen B. Luce

Stephen B. Luce, the Navy's outstanding educator of the 19th century, was born in 1827 and entered the Service as a midshipman at the age of fourteen. During most of the Civil War he was attached to the Atlantic coast blockaders and, for a time, commanded a monitor at the siege of Charleston, South Carolina. Even at this time, Luce was deeply interested in the training of personnel and, in 1862, while on a tour of duty at the Naval Academy, he prepared one of the best-known seamanship textbooks.

After the war Luce commanded the Naval Academy Practice Squadron for five years and in 1875 organized the Navy's apprentice training system. Its purpose was to train American boys to take their places in the fleet as seamen and petty officers. Throughout his life Luce insisted that the Navy should be an educational institution for all hands—with all hands working to get ahead and with advancement always open to trained personnel.

Captain Luce was appointed Inspector of Training Ships from 1878 to 1881 and, as Commodore, he commanded the United States Training Squadron from 1881 to 1884, hauling down his flag when he was transferred to command the North Atlantic Squadron. By this time the training system had been firmly established, and its later development into the Naval Training Stations at Newport, the Great Lakes, and elsewhere, followed directly from Luce's pioneer work.

But Luce made officer education an objective fully as important as apprentice training, and the need was never greater than at that time. He insisted that the art of war was the vital study for naval officers. And since command in time of war should be the ambition of every line officer, strategy and tactics, to use Luce's words, "might well occupy the very best thoughts of the naval officer, for they belong to the very highest branch of his profession."

Through the 1870's and early 1880's Luce took the lead in urging the establishment of a war college where senior officers might study the art of war, that is, strategy and tactics. Luce once said that good gunners, good engineers, good communicators are found abundantly in every navy in time of war, but that good admirals are always too few in number.

Finally in 1884 Luce was successful in having the Naval War College established at Newport, Rhode Island. The primary function of this institution was to train senior officers to think in terms of up-to-date fleet evolutions; to study and master broad strategic concepts; to prepare themselves for the handling of modern fleets in battle. It was the first institution of its kind in the world.

In general, the Service was skeptical of the school. Older officers, raised in the school of "knot and splice" seamanship, did not relish attending any other kind of school. One old-timer said, "Teach the art of war! Well, I'll be damned! You have Cooper's *Nautical History*, what more do you want?" Nevertheless time was to prove the great value of this institution.

During his professional life and until he died in 1917 at the age of 90, Admiral Luce fought tirelessly for continued improvement in ship and gun design; for the introduction of ever better methods of administration into the Navy Department. His work in the Service contributed immeasurably to bracing the morale of enlisted personnel and of officers during the 25 years of gross neglect after the Civil War, the period before the American people came to realize the requirements of a sound naval policy, conforming to the realities of the international situation. A study of Luce provides great example and inspiration for forward-looking officers ambitious for the continued growth of the Service.

Alfred T. Mahan

The fourth and last of the great peacetime naval tradition-makers to be considered is Alfred T. Mahan. His story as a line officer is uneventful. However, he occupies a supreme position in the Navy as a writer, and his particular theme is sea power.

Born at West Point in 1840, Mahan attended Columbia University for two years and then in 1856 was admitted to the second year at the Naval Academy at Annapolis. Graduating second in his class, he served at sea during the Civil War, and this duty was followed by routine and uneventful service until 1885. At the request of Stephen B. Luce, his former commanding officer, he was called to duty as a lecturer at the new Naval War College at Newport, Rhode Island.

Mahan entered his new work with consuming zeal and his attitude toward it was one of almost religious devotion. He felt that the War College should train officers to go beyond the mere mechanics of their profession; that it should seek through historical studies to develop the rarer and more intangible qualities of "the artist in war . . . intuition, sagacity, judgment, daring, inspiration—which place great captains among creators, and war itself among the fine arts." Mahan's lectures became world famous.

In 1890 he published the first of his many great works. Titled *The Influence of Sea Power upon History, 1660-1783,* it was based upon his lectures on naval history and sea power. Among many other things, he pointed out that victory for a nation at war ordinarily depends upon control of the sea and that it is dangerous to misinterpret the lessons of history. It was one of the most influential books ever written and was received with great enthusiasm in Great Britain and elsewhere. In Germany, the Kaiser wrote:

> I am just now not reading but devouring Captain Mahan's book; and I am trying to learn it by heart. It is a first-class work and classical in all points. It is on board all my ships and constantly quoted by my captains and officers.

Mahan's works were promptly translated by the Japanese and it is said that Japanese midshipmen read Mahan in the original to learn English. His fame spread around the world and his works helped to reshape the navies of the great powers.

For many years after 1890 Mahan greatly influenced the Secretaries of the Navy, the Congress, and in particular President Theodore Roosevelt. He was influential in the building of our battle fleet after 1890. His works contributed greatly to the change in American public opinion whereby the need for a capital ship navy came to be universally accepted. Further, he taught the Navy to study and to write, and a multitude have followed his distinguished example.

PHILOSOPHER OF NAVAL TACTICS
Mahan's researches in military history prove that the nation controlling the oceans is the nation that maintains its supremacy in war or peace.

In appearance Mahan was tall, spare, erect, with blue eyes and fair complexion. He was dignified, courteous, extremely modest, reticent in speech, and somewhat shy. To strangers he presented the aspect of a philosopher, grave and self-contained. The few who enjoyed the rare privilege of his intimacy considered him good company and the possessor of a keen sense of humor and a fund of delightful anecdotes.

Conclusion

It is apparent that when the Navy embarks on the mission for which it was created—the defense of the United States—its success is due in no small measure to the heroes who have fought the battle in peacetime. Their "battles" frequently consist of nothing more than patient and painstaking effort year after year on tasks that may seem to bear little relation to war itself—but these less spectacular tasks often lead to victory in war. Our Navy owes its preeminent position today no less to the unheralded reformers who strove against the reactionary forces within, than to the more popular heroes of war. These and many other reformers did not look back complacently on the Navy's past glories; they were not content to coast on its reputation. They were disturbed and moved to action by the greatness of the task that always lies ahead. Their pride in achievements was always paralleled by an overwhelming sense of the magnitude of the job that was to be done. These men consecrated their lives to one ideal: "The fighting efficiency of the Navy, and its instant readiness for war." While seldom slogan-makers, they were often tradition-makers.

SPANISH-AMERICAN WAR

An Unequal Contest

The Spanish-American War broke out in 1898 after a long series of incidents arising from unsettled conditions in Spain's Caribbean possessions. It was evident from the first that the war would be primarily naval, and would be decided in favor of the nation able to establish control of the western Atlantic. While the naval strength of the two countries was about equal on paper, Spain's ships were poorly equipped, her personnel lacked training, and her officers displayed poor leadership.

Theodore Roosevelt, Assistant Secretary of the Navy in 1897, and an enthusiastic disciple of Mahan, was influential in whipping the Navy into shape for the war. In the overwhelming victory for the United States, the Navy played a notable part by defeating two Spanish fleets.

Richmond P. Hobson

Two events in the Spanish-American War are reminiscent of the naval golden age. In the spring of 1898, a Spanish fleet under Admiral Cervera was trapped in Santiago harbor. Admiral William Sampson, who was in command of the American forces, planned to close the neck of the narrow harbor and then have the Army cut the ground from under the enemy. On the night of 3 June, Lieutenant R. P. Hobson, accompanied by seven volunteers, each of whom realized fully the danger, set out in the old collier *Merrimac* which contained torpedoes placed below the waterline. By means of electricity, these were to be exploded, thereby sinking the ship in the narrow neck while Hobson and his crew got away in a small boat. Before they reached their destination, however, a hail of shots greeted the *Merrimac* at close range from the Spanish fort. Under this infernal fire, they proceeded. When almost at their goal, a chance shot disabled the steering gear. The ship, out of control, drifted into deep water and sank. Although the expedition ended in failure like that of the *Intrepid* under Somers almost a hundred years earlier, the sheer boldness of the act and the heroism of Hobson's little band was cordially applauded by the nation. Even Admiral Cervera, who picked up the adventurers, only two of whom were wounded, sent his hearty congratulations to Admiral Sampson. Those who follow the sea feel a brotherhood with seamen of all nations —a pride of profession.

Victory at Santiago

Soon afterward, the Spanish fleet suddenly steamed out of the harbor, intent on escape. Because of the temporary absence of Admiral Sampson, Commodore Winfield Schley was in command. Within a few hours, the Spanish fleet was entirely destroyed, either sunk or beached. Spain's efforts on the seas virtually ceased after her defeat at Santiago.

Great hardship and anxiety had been endured by the American forces because of lack of suitable dispatch vessels, lack of fueling bases and of proper equipment for fueling at sea. The strain on Sampson and Schley was indeed great. But there were almost no casualties in spite of the fact that these ships fought at extremely close range with powerful, modern guns. Under the leadership of Sampson and Schley, the Americans had attained a brilliant victory.

DEWEY SINKS THE SPANISH FLEET
Carefully briefed, the American ships run by night the gauntlet of Spanish ships and shore batteries and finally reach victory in the spectacular Battle of Manila Bay.

George Dewey

A short time prior to the battle of Santiago, Commodore Dewey's name became immortal at the famous Battle of Manila Bay. On that occasion, the Spanish admiral knew that Dewey's fleet was somewhere in the vicinity. However, he did not suspect that the American would have the audacity to steam into a mined harbor during the night, with forts on either side and the Spanish squadron ready to receive him.

While laying his plans, Dewey said he tried to figure out what Farragut would have done when so confronted, for Farragut had been the inspiration of his life. The influence of a great leader is borne out in Dewey's statement: "Valuable as the training of Annapolis was, it was poor schooling beside that of serving under Farragut in time of war." At Manila, Farragut, although long dead, was his leader—his great spirit still lived.

Following a thorough study of the situation, Dewey decided to make a daring move. As it turned out, this unexpected blow, so timed, was half the victory. His undertaking was characterized by singleness of purpose, resolution, and swift action. His instructions were, "We shall enter Manila Bay tonight, and you will follow the motions and movements of the flagship, which will lead."

At 0540, when the range had been reduced to two and one-half miles, Dewey, standing on the bridge of the *Olympia*, quietly gave the order, "You may fire when you are ready, Gridley." By noon, not a single Spanish fighting ship remained afloat. While it is true that the enemy defense was notoriously inefficient, nevertheless this was a signal victory.

Shortly afterward, Dewey was made an Admiral of the Navy, following in the steps of Farragut, who had earlier been appointed Admiral by Congress. Dewey lives in naval history as a resolute and able commander.

Dewey stressed preparedness. Before leaving the United States he had obtained all the information available on the Spanish fleet; he secured charts and other data on the Philippines and made a detailed study of international law. Before the battle he discussed with his officers every detail of tactics and strategy. Every ship captain knew each detail of how and when to act.

The two great victories of the Spanish-American War, Santiago and Manila, were brought about by the same forces that enabled Perry to win at Lake Erie, Macdonough to win at Lake Champlain, and Farragut to win at Mobile Bay. These victories were not due to spectacular exploits but simply to forehandedness and hard work. In the words of Admiral Dewey, "It was the ceaseless routine of hard work and preparation in time of peace that won Manila and Santiago."

TURN OF THE CENTURY

Continued Expansion

From the Spanish-American War the United States emerged with the majority of her present-day insular possessions: the Philippines, Hawaii (annexed before end of war), Puerto Rico, Guam, Midway, Wake, and a protectorate over Cuba.

Immediately following every war there comes the cry to do away with armaments. Beginning with the Revolution it became the rule, upon the termination of hostilities, to decrease the Naval Establishment drastically both in men and ships. The Spanish-American War stands out as the conspicuous exception. Instead of drifting into a decline, the new Navy sailed forward. Two reasons for this continued expansion were the obvious need for a large Navy to protect our new possessions, and the enthusiasm of President Theodore Roosevelt for the Navy—an enthusiasm entertained especially since his holding of the office of Assistant Secretary of the Navy. A big Navy gave Roosevelt the opportunity of carrying out his policy of "speaking softly and carrying a big stick."

The changes in the various navies of the world between 1900 and the beginning of World War I were primarily concerned with the development of the capital ship theory and the development of the submarine and airplane. It must be admitted that although the ideas for these innovations were the result of American genius, the Navy was not always prompt in recognizing their potentialities.

William S. Sims

Admiral William S. Sims contributed to the Naval Service both in peace and in war. Like Maury, Dahlgren, Luce, and Mahan, Sims encountered opposition to his progressive ideas from the Navy itself. It is not surprising that many of his superiors, comfortably settled in conventional routine, regarded him as an intolerable nuisance. He was always seeing something that needed correction; he was the stormy petrel of the Navy.

At the turn of the century our deplorable showing at target practice troubled Lieutenant Sims. It had been pointed out that at Santiago 120 hits were scored and 9,000 projectiles fired. The usual response, "Well, we annihilated them at Manila and Santiago, didn't we?" was not convincing to Lieutenant Sims. He agreed with Mahan's wise comment that "never again would the United States be lucky enough to meet an opponent as weak as Spain proved to be." A clear call for action came from the Far East where Sims, one of the hardest-working officers of the Navy, was serving as Fleet Intelligence Officer of the Asiatic Squadron.

As a result of long study, Sims became convinced that the gunnery of the United States Navy could—and should—be improved. So effective were his suggestions that he was ordered home in 1903 and installed as Inspector of Target Practice. Here his

EXCELLENCE THROUGH COMPETITION
To improve gunnery, Sims developed a keen competitive spirit in the fleet. He raised the accuracy of fleet gunnery to near-perfection during the years that he served as Inspector of Target Practice.

enthusiasm and energy found full expression. Sims revolutionized fleet gunnery, influenced the design of our first all-big-gun battleship, and introduced new and improved destroyer tactics. Reforms in range finding, spotting, and target practice were adopted.

A keen competitive spirit in the fleet gun crews was developed. Gunnery prizes were offered and records for all calibers were broken every year: In 1903 the fleet average for all guns was approximately 40 percent; in 1906 it was almost 78 percent. When Sims left the Target Practice Office in 1909, the United States Navy led the world in gunnery.

Next, Sims, after setting forth the great need for modification in ship construction, was instrumental in bringing about other important changes. Thus the United States Navy took the lead not only in gunnery but also in ship design.

Sims was advised and supported by many of the fleet's ablest officers, especially by Commander (later Admiral) Bradley A. Fiske, one of the Navy's foremost scientists and inventors. Back in the 1890's Fiske invented the telescopic sight, the stadimeter for range finding and station keeping, the electric range finder, the turret range finder, and in 1912 he played an important part in the development of the torpedo-carrying airplane.

It was Admiral Sims who was greatly influential in preparing the Navy for World War I. He was selected to command the United States naval forces in European waters during that war and was effective in coordinating American and British naval operations. Sims exercised a lasting influence upon officers and men who served under him. Like Farragut, Nelson, and other great leaders, he had the capacity for securing the enthusiastic and loyal support of his subordinates.

WORLD WAR I

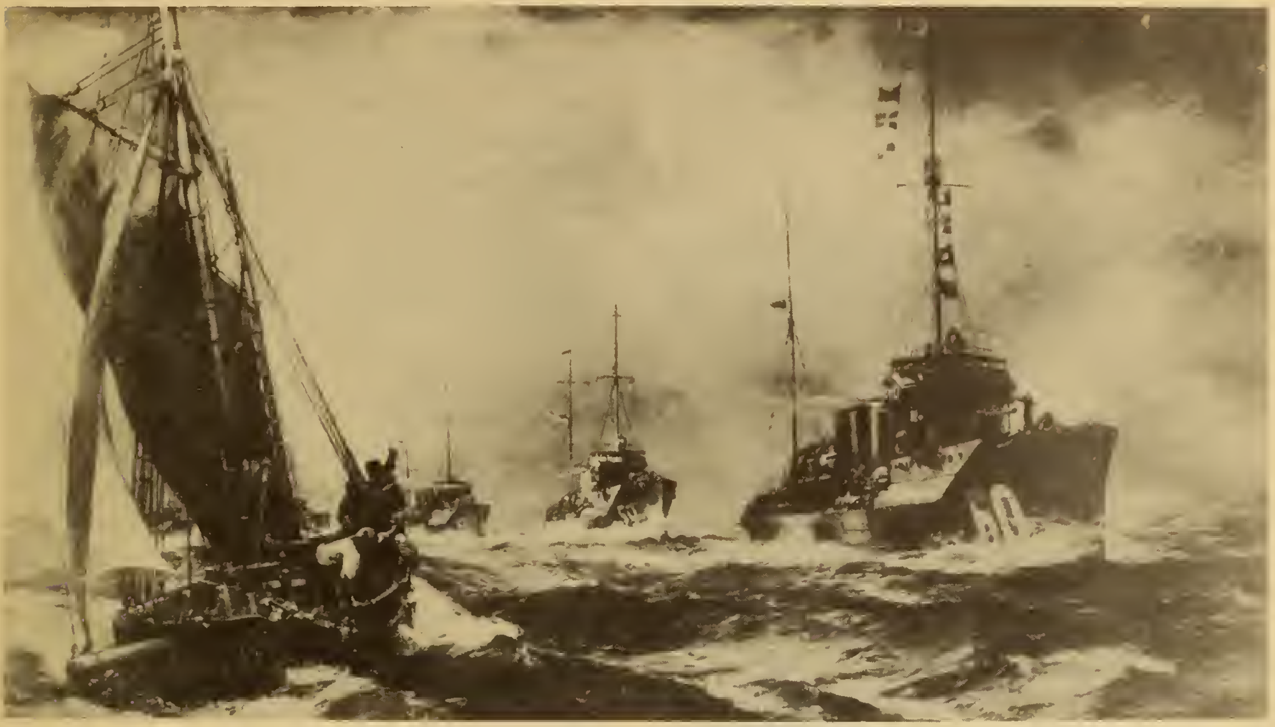
Sea Power Again Brings Victory

Several days after our declaration of war against Germany in April 1917, Rear Admiral Sims, who had just come from Newport where he had served as President of the Naval War College, arrived in London to confer with the British First Sea Lord, Admiral Jellicoe. The status of the submarine war was explained to Sims. It was revealed that available Allied shipping had been depleted by one-fourth, that losses then were at an appalling rate—April losses alone threatened to reach the unprecedented figure of 900,000 tons. Sims realized that at this rate England, with only a month's grain supply on hand, must starve or surrender within a few months' time. Both Sims and Jellicoe saw that Germany was undoubtedly winning the war.

GERMANS SURRENDER THEIR FLEET IN WORLD WAR I
Admiral Sims and Admiral Rodman watch the parade of might that marked the end of the Kaiser's hope for world domination.

With Germany building underwater craft at the rate of three a week, it was obvious that the submarine menace had to be drastically curtailed if the Allies were to survive. Sims appealed to the Navy Department to send promptly the maximum number of destroyers and other antisubmarine craft, auxiliaries, and merchant tonnage. Within a month after our entry into the war, the first American naval forces began to arrive in Britain ready for duty.

From a naval point of view, World War I was a conflict of two blockades, the Allies maintaining a long-distance blockade of German ports, and the Germans with the submarine trying to blockade British and French ports by attacking ships as they sailed the sea. The unrestricted sinking of neutral American merchant ships was one reason for our entry into the



SIX AMERICAN DESTROYERS REACH IRELAND IN WORLD WAR I
Our preparedness and naval power enabled us to take steps to combat Germany's unrestricted sinkings of our neutral merchant ships.

war. As a result, it was the cruiser, the destroyer, and the newly constructed subchaser which saw most of the action of tracking down the German submarines. Some of our capital ships were stationed in Britain to help patrol the North Sea in case the German fleet came out for battle. Such a battle, however, never occurred.

The Allied victory resulted in part from the combined navies' efforts in transporting about two million American soldiers and Marines to France and in convoying munitions and supplies needed to sustain them and their Allies. In addition to fighting the submarines on the seas, the United States Navy was mainly responsible for the 240-mile mine barrage in the North Sea.

"We Are Ready Now, Sir"

On the fourth of May, less than a month after war had been declared, six American destroyers under Commander J. K. Taussig steamed into Queenstown—"the return of the Mayflower" after three centuries. Commander Taussig immediately reported to Admiral Lewis Bayly, R.N., Commanding Officer at Queenstown. Considering the long, arduous, ocean voyage, it is little wonder that the British officer was taken aback by the American's answer to his question, "How soon will you be ready to go on patrol?" Taussig's reply, which characterized the Navy during the war and has since become a Navy slogan, was, "We are ready now, sir." It indicated the same careful preparation and planning we observed with Decatur in the Mediterranean, with Farragut in the Gulf, and Dewey at Manila.

The Cassin Incident

In October 1917, the destroyer *Cassin* was patrolling off the Irish coast. Gunner's Mate O. K. Ingram suddenly spied a torpedo coming from a German submarine toward the stern of the *Cassin*. He realized that if the missile struck the vessel where the depth charges were stowed, the ship would be blown up. Instead of saving himself, he deliberately rushed aft to throw the charges overboard. The torpedo found its mark—the destroyer's stern; it detonated, set off the depth charges still on board, killed Ingram, and temporarily disabled the ship. This bluejacket sacrificed his life to save his ship and the lives of the officers and men on board. The destroyer *Ingram* commemorates his name.

Charles L. Ausburne

Another incident that occurred on the high seas has played its part in building our store of naval traditions. The transport *Antilles*, bound for the United States from Europe in October 1917, was struck suddenly by a torpedo shortly after daylight. Radio Electrician Ausburne at the wireless station frantically sent out distress signals. Time was short. The ship was sinking rapidly. In less than five minutes it went down. Ausburne, disregarding his own safety stuck to his post to the end, vainly attempting to obtain help for his ship. As in the case of Ingram, a destroyer, USS *Charles Ausburne*, commemorates the sacrifice of Radio Electrician Ausburne.

WORLD WAR II

Surprise Attack

World War II started for the United States with Japan's surprise attack on Pearl Harbor on 7 December 1941, an attack not dissimilar to those that she made when initiating war on China in 1894 and on Russia in 1904. Three hours after the attack, Japan declared war on the United States and several days later Germany and Italy followed suit.

The United States was in a two-ocean war. We needed men, ships, planes, and supplies and we needed them desperately and quickly. The Navy was forced to fight simultaneously on two oceans over gigantic distances. New fighting methods had to be perfected. The Navy was assigned the task of carrying the Army and Marines into vast combat theaters and delivering them on hostile beaches.

She also had the task of defeating the enemy's naval forces and of protecting our supply lines so vital to the Allies and to American forces overseas.

The Axis Powers had gambled on our inability to produce ships and planes and to train and equip an Army and Navy quickly enough to interfere with the successes of their carefully planned blitz war. They miscalculated.

Deeds of today furnish the inspiration of tomorrow. In conflicts where the immediate stakes are death and life and where the long-term stakes are the survival of a way of life and of a civilization, men are forced for a period to show their supreme best. During such crises, they work beyond their strength for long hours; they hit harder and faster than they ever have; they make split-second—and correct—decisions; and they give up their own lives to let others live. Their heroism lives on in traditions that become the motivating force of future generations—traditions of courage, of hard work, of lightning and shrewd judgments, and of generous self-sacrifice.

Naval archives contain innumerable records of heroism in World War II which could be used as illustrations. Here are just four picked at random.

Seaman Johnnie Hutchins

In 1943 Seaman Johnnie Hutchins took his place among the tradition-makers of the United States Navy. At that time the LST 473, carrying men, tanks, and supplies, was part of a landing force that was heading for a Jap position on New Guinea. Stiff opposition was being met and, as the ship advanced, shells were dropping in the water close aboard. Suddenly a Jap torpedo plane dived low out of the sky and launched its torpedo directly at the LST. In the pilot house the steersman saw the torpedo coming, as did Seaman Hutchins who stood at his battle station nearby. Before the steersman could swing the ship out of the torpedo's path, he was killed by a bomb that hit the pilot house. Although Hutchins was fatally wounded, he summoned enough strength to stagger to the wheel and turn the ship clear of the torpedo. The ship was saved, but Hutchins died in a few minutes. In the face of death this man's last thought was not of himself but of his mission. Later a destroyer was christened the USS *Johnnie Hutchins*, commemorating a man who had "rendered distinguished service to his country."

Commander Howard W. Gilmore

The unrelaxed vigilance, skill, and matter-of-fact daring of the Submarine Service furnished many tradition-makers in World War II. The story of Commander Howard W. Gilmore is well known.

In command of the submarine *Growler* in the Southwest Pacific, he had just sunk one Japanese freighter, damaged another, and found himself fighting a surface engagement with a Japanese gunboat.

Gunfire had badly wounded Gilmore and had seriously damaged his submarine. To save his ship it was necessary to make a quick dive. He calmly gave the order to clear the bridge, knowing that his own life would be sacrificed since time did not permit even the few seconds' delay needed to help him below. Unhesitatingly he ordered the officer of the deck, "Take her down." The well-trained crew, inspired by the courageous fighting spirit of their dead leader, brought the damaged submarine to port.

Chaplain Rentz

The third incident concerns a chaplain, a member of a corps which cherishes many sacred traditions built up through its long history. Chaplain George S. Rentz was serving aboard the cruiser *Houston* in 1942 when that ship went down. Fortunate in having a life jacket, Rentz succeeded in getting to a life raft. Some men in the water had no life jackets; others were wounded; and many more were at the point of exhaustion. The life raft to which Rentz clung had more than its allotted number and still others were seeking the safety it provided. Realizing the situation, the 60-year-old Chaplain took off his life preserver and as he gave it to a young seaman, said; "I am an old man. I have lived the major part of my life, and I am willing to go. You are young and your life is yet before you. You take this." Several men remonstrated, but the Chaplain was firm. After offering an audible prayer for his shipmates, Chaplain Rentz deliberately slipped from the raft and swam away. The men watched. Exhausted, he remained afloat only a short time, then disappeared. "Greater love hath no man . . ."

Flag-raising on Iwo Jima

One of the most heroic examples of Marine and Navy leadership is associated with Iwo Jima. Iwo Jima was only a lump of volcanic bleakness somewhere in the Pacific, but it was Japanese, and the Americans had to capture it as a base for fighter pilots protecting B-29 bombing expeditions which were to end the war sooner and thus save millions of lives that might have been lost in a direct invasion.

Iwo Jima goes down in history as one of the most costly and frightful battles of the war in which men had to die and keep on dying, for the Japanese, hidden in caves and camouflaged blockhouses, possessed plenty of ammunition and courage and knew just what the attack strategy would be.

Marines from the 800 invasion ships lying off the island had to deliver the knockout blows, had to go in and pour out their sweat and blood to make the island American.

AP Photo—Rosenthal

FLAG-RAISING ON MOUNT SURIBACHI

Marines raise the colors under fire after charge up Mount Suribachi.

WE LOST THE CARRIER—BUT NOT THE CREW
The USS *Lexington* sinks in the battle of the Coral Sea but its men lived to fight again.

Though the Marines did land and dig in and fight forward, the Japanese, sheltered in concrete pillboxes and underground caves, continued to slaughter them with fiendish ferocity. Especially devastating was the gunfire which kept raking the landing beaches from the volcanic mountain, Suribachi, 554 feet high. The mountain had to be captured, and the bitter struggle went on to final victory.

The symbol of victory is perpetuated in the group of six men—five Marines and a pharmacist's mate—who struggled up the final yards of the mountain to raise an American flag on the first piece of captured Japanese territory in World War II. The date was 23 February 1945.

These six men (Sergeant Michael Strank of Pennsylvania, Corporal Harlan H. Block of Texas, Privates First Class Franklin R. Sousley of Kentucky, Rene A. Gagnon of New Hampshire, and Ira H. Hayes of Arizona; and Pharmacist's Mate Second Class John H. Bradley of Wisconsin) are singled out to stand as representatives of what Admiral Chester W. Nimitz called the "uncommon valor" shown by the Marines on Iwo Jima at a cost of 5,017 dead and 17,145 wounded.

These sacrifices live on in the minds and hearts of Americans. A monument and flagstaff were dedicated to these heroes on top of Mount Suribachi, and a 36-foot bronze statue unveiled in front of the Navy Building in Washington. (It has since been moved to Quantico, Virginia.)

* * *

In the Pacific, early in the recent war, when it became evident that the *Lexington* was doomed, it was with a heavy heart that Admiral Aubrey Fitch made plans to abandon ship. At the final moment, he turned quietly to her captain and said, "Well, Fred, I guess it's time to get the boys off." Perhaps he visualized Admiral Dewey at Manila Bay in 1898 leaning over the bridge and casually saying: "Fire when you are ready, Gridley." Dewey later said that he asked himself at that critical moment, "What would Farragut do?" The Admiral well knew the answer, for he, as a young lieutenant, had served under Farragut during the Civil War. Farragut, in turn, at the age of twelve, learned his lessons from Commander David Porter in the War of 1812. Porter, again, had served under the brilliant Thomas Truxtun in the war with France in 1799 when the *Constellation* defeated the *Insurgente*. Truxtun, as we know, was a contemporary of John Paul Jones and both fought during the Revolutionary War.

Such is the unbroken chain of our great naval traditions. The deeds of today become the inspiration of tomorrow.

A letter was received early in the war from Marine Lieutenant Anthony Tortoras, an aviator at Guadalcanal. A postscript in this letter addressed to his parents reads as follows: "Always pray, not that I shall come back, but that I will have the courage to do my duty." He will not come back and he has done his duty. And so another link has been added to the continuing chain of our naval tradition.

In closing, it is appropriate to consider the words of Rear Admiral Albert Gleaves, USN:

"May we not who are of their brotherhood claim that in a small way at least we are partakers of their glory? Certainly it is our duty to keep these traditions alive and in our memory, and to pass them on untarnished to those who come after us."

CHAPTER 3

NAVAL COURTESY AND CUSTOMS—Part I

INTRODUCTION

The phrase "an officer and a gentleman" is not intended to indicate a dual personality. The terms *officer* and *gentleman* are, in truth, synonymous. Some of the requisite traits of the true officer are honesty, integrity, loyalty, dependability, regard for the rights of others, tolerance, understanding, self-confidence, sense of humor, ability to treat all men as equals, tact, and adherence to the established code of rules. A careful study of the above characteristics will prove that these are also the traits of the real gentleman. It is erroneous for a man to believe that while he is performing in the capacity of an officer he can ever lay aside the traits of a gentleman. To be truly successful as an officer, he must always conduct himself as a gentleman.

Too often the accelerated pace of modern living is used as an excuse for neglecting the acts of courtesy that mark the gentleman. But this is only rationalization. The simple acts of courtesy must be practiced continually until they become an integral part of the individual's personality. When this state is attained, regardless of the pressure under which he may be performing, the officer will truly personify the phrase "an officer and a gentleman."

John Paul Jones in a letter to Congress in 1775 wrote, "It is by no means enough that an officer of the Navy should be a capable mariner. He must be that, of course, but also a great deal more. He should be as well a gentleman of liberal education, refined manners, punctilious courtesy, and the nicest sense of personal honor." It is the purpose of this and the following chapter to introduce most of the main aspects of military courtesy and etiquette, both as to the traditional elements that still survive and those that have changed with the passage of time.

THE SALUTE

Meaning and Background

One of the main aspects of military courtesy is the salute. The regulations governing its use are founded on military etiquette and, as such, are deeply rooted in the traditions and customs of the Naval Service.

Far from being a servile gesture, the salute is an affirmation of the importance of *all* members. It is the democratic sign of comradeship among service personnel. Accordingly, it is a uniform gesture; that is, the highest admiral returns the salute in the same form in which it is rendered to him.

The custom of saluting is a time-honored demonstration of politeness that is in use among military men the world over. Throughout your Navy's history, the salute has been the appropriate gesture; a friendly, courteous greeting, and the privilege of service personnel alone. Exchanged between officers and men, it is a token of mutual respect and a gesture expressing pride in the Service. By saluting first, no officer or

ONE OF THE MAIN ASPECTS OF MILITARY COURTESY

Between officers and men, the salute is a token of mutual respect, an expression of pride in the Service.

man implies that he is in any sense inferior to the senior whom he salutes.

Saluting is simply a way of observing good manners. An employee greets his boss with a friendly, "Good morning," and friends or fellow employees greet each other similarly in passing. A cheerful smile and a greeting mark you as a courteous, friendly person; if you neglect these little courtesies, you gain the reputation of being crude and unsociable. Saying, "Good morning," first to an employer certainly doesn't give rise to a feeling of inferiority. And so it is with the salute you render when wearing the Navy uniform—you are simply making a gesture that demonstrates your knowledge of what is the correct, courteous thing to do.

Why salute? A military organization functions efficiently only as a unit, and any common bond or identifying symbol that furthers the feeling of fellowship strengthens that unity. The words of General John J. Pershing, the Commanding General of the A.E.F. in World War I, indicate the importance of saluting in the minds of fighting men. "Send me men who can shoot and salute," he demanded.

In form, the salute is simple and dignified. But there is great significance in that simple, uniform gesture. It says, "I am a member of a great military organization and proud to be a member of it. I am happy to indicate my membership by giving the accepted sign. Furthermore, I am glad to acknowledge a blood-brother in my organization; I know we have a job to do together, and I respect him for his part in doing it even as he respects me for my part in doing it." The privilege of saluting is generally denied a man who is being disciplined and is a prisoner, since his status is that of one unworthy of the fellowship of military men.

Sometimes, as during a war, young Reserve officers may feel abashed at rating a salute from a chief petty officer with three or four gold hashmarks on his sleeve, or even from a young seaman with a flock of ribbons across his jumper. What these officers do not understand is that the man rendering the salute is aware of its meaning and knows that the officer is doing a necessary job or he would not be in naval uniform. And from such salutes, properly understood, properly given, and properly returned, comes the best effect of the salute: the strength that is derived from being part of an organization which has in it these experienced and proven men working toward a common purpose.

Origin of the Salute. It is plausible to place the origin of the salute in the days of chivalry. At that time it was customary for knights in mail to raise their visors to friends for the purpose of identification. Because of strict gradations of rank, the junior was required to make the first gesture. But another school of thought traces the salute back to a Roman custom at the time of the Borgias. Assassinations by dagger were apparently not uncommon at that time and it became the custom for men to approach each other with raised hand, palm to the front, to show that there was no dagger concealed.

However, in the American Navy, it seems reasonable to assume that the hand salute came to us directly from the British Navy. There is general agreement that the salute as now rendered is really the first part of the movement of uncovering. From the earliest days of military units, the junior uncovered when meeting or addressing a senior. Gradually, the act of taking off one's cap was simplified into merely touching the cap and, finally, into the present salute.

Proper Manner of Saluting

Except when walking, one should always be at attention when saluting. The right hand is raised smartly until the tip of the forefinger touches the lower part of the headgear or forehead above and slightly to the right of the right eye. Thumb and fingers are extended and joined. The palm is turned slightly inward until you can just see its surface from the corner of your right eye. The upper arm is parallel to the ground, the elbow slightly in front of the body. The forearm is inclined at a 45-degree angle and the hand and wrist are in a straight line.

It is important that the head and eyes be turned toward the person saluted. One completes the salute (after it is returned) by dropping the arm to its normal position in one sharp, clean motion, at the same time turning the head and eyes to the front.

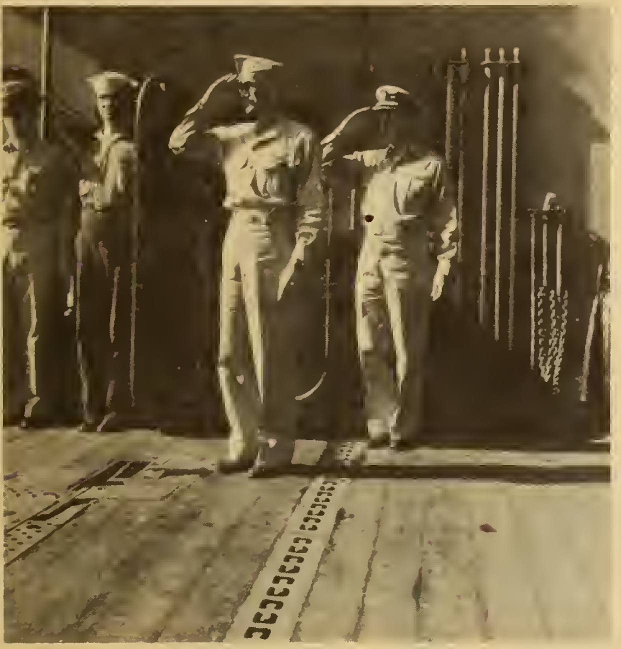
The first position of the hand salute is executed when six paces from the person saluted, or at the nearest point of approach, if more than six paces. (Thirty paces is generally regarded as maximum saluting distance.) The first position should be held until the person saluted has passed or the salute is returned.

Naval custom permits saluting with the left hand when a salute cannot be rendered with the right hand. (Army custom holds to the use of the right hand.)

Certain common errors in saluting should be avoided. The major faults to watch are these:

- Bowing the head as the salute is given.
- Dropping the salute before it has been returned.
- Casual, perfunctory, or sloppy salute.
- Holding the arm awkwardly high or letting it sag too low.
- Saluting on the double.

THE PRIVILEGE OF SERVICE PERSONNEL ALONE
The salute, based on military etiquette, is deeply founded in the traditions and customs of the Naval Service. Here it is rendered to the President of the United States as he comes aboard USS *Missouri*.



THE SALUTE IS A UNIFORM GREETING
An admiral returns the salute in the same form in which it is rendered to him.

Avoiding the gaze of the person saluted.
Saluting with pipe, cigar, or cigarette in the mouth or in the hand.
Waiting too long to begin the salute.

Whom to Salute

In the Navy, as in practically every military service in the world, everybody salutes—from the bottom to the top and down again. Enlisted men salute all officers and every officer salutes his seniors. Salutes are required to be returned by all who are saluted. (No one in the Naval Service salutes when uncovered unless failure to do so might result in embarrassment or misunderstanding.)

Salutes are extended to officers of the Navy, Army, Air Force, Marine Corps, and Coast Guard; to foreign military and naval officers whose governments are formally recognized by the government of the United States; and, when in uniform, to officers of the Naval, Army, Air Force, Marine Corps, and Coast Guard Reserve, and of the National Guard.

When several officers in company are saluted, all return the salute. For example, if an ensign were walking down the street with a commander and an Army captain approached, it would be improper for the ensign to salute the captain until the captain first saluted the commander. As the commander returns the salute, his companion, the ensign, salutes simultaneously. If there were two or more persons of various ranks in the group with the senior officer, they would render the salute when the senior officer returned the salute accorded him.

All civilians who are entitled, by reason of their position, to gun salutes or other honors, are also entitled by custom to the salute.

Regulations covering saluting apply also to women in Military Service, both officer and enlisted, and are the same as those governing other members of the Navy. The only exception is found in the case of women personnel who wear their caps and hats in certain public places (such as the theater or church) when men uncover; in these instances, women are technically "uncovered" and do not salute.

When to Salute

There are many situations when salutes are required. A number of these are listed below, grouped under various headings, in order to simplify the presentation of the material.

1. *Aboard Ship.* All officers and enlisted men on board a ship of the Navy salute all flag officers (officers above the rank of captain), captains of ships, and officers senior to themselves from other ships on every occasion of meeting, passing near, or being addressed.

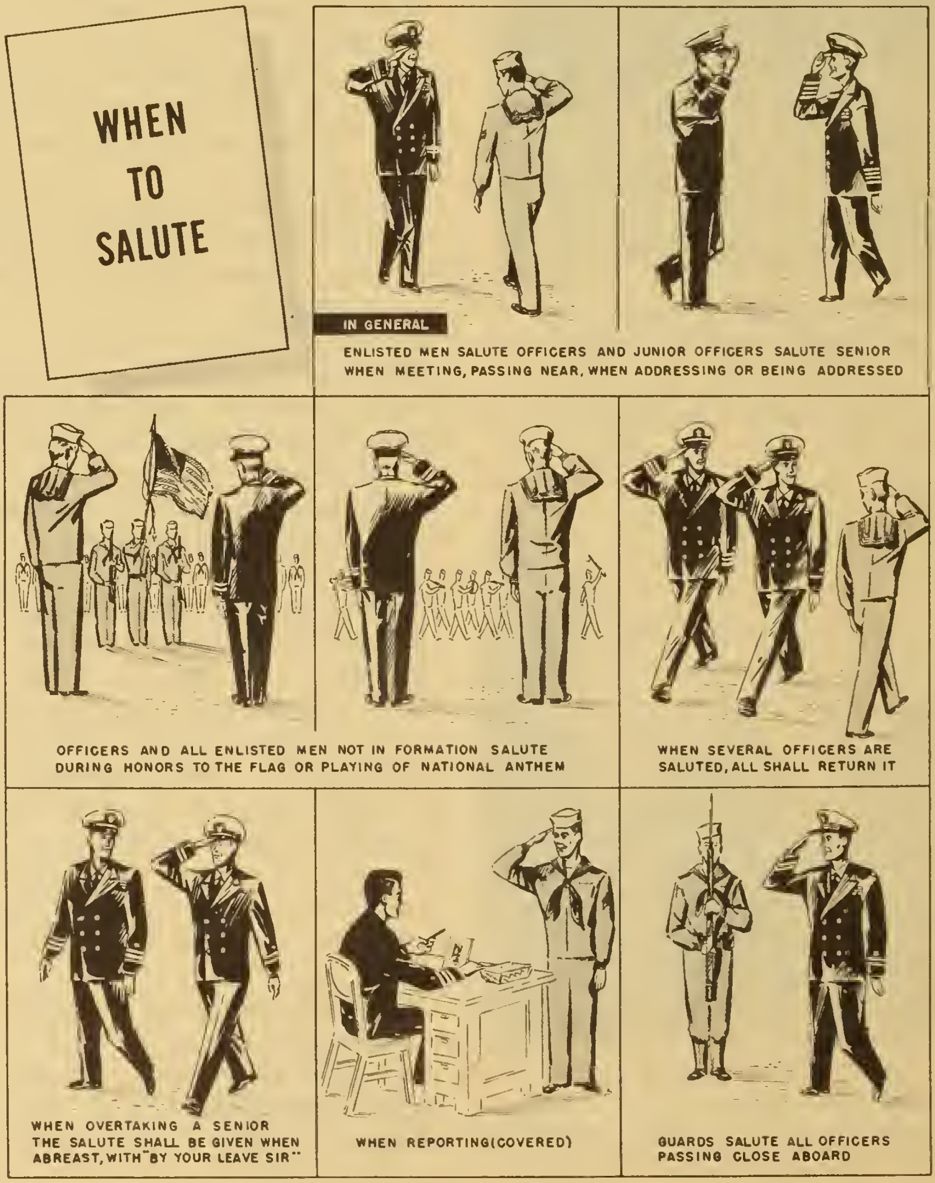
They salute all officers senior to themselves attached to the same ship on their first daily meeting, and upon addressing or being addressed by their seniors. They salute the executive or other senior officer when that officer is making an official inspection. At other times when the progress of a senior officer may be impeded, officers and men clear a gangway and stand at attention facing the senior officer until he has passed.

2. *In Boats.* Men seated in boats in which there is no officer, petty officer, or acting petty officer in charge, lying at landings, gangways or booms, rise and salute all officers passing near. When an officer, petty officer, or acting petty officer is in charge of a boat, he alone renders the salute.

Officers seated in boats rise in rendering and returning salutes when a senior enters or leaves the boat, or when acknowledging a gun salute.

Coxswains in charge of boats rise, unless by so doing the safety of the boat is imperiled, and salute when officers enter or leave their boats. In fact, coxswains always rise when extending a salute to commissioned officers, unless safety is endangered by so doing.

Boatkeepers and all other men in boats not underway and not carrying an officer stand and salute when an officer comes alongside, leaves the side, or passes near them. If boat awnings are spread, men sit at attention and salute with the hand, but without rising.


WHEN TO SALUTE

IN GENERAL

ENLISTED MEN SALUTE OFFICERS AND JUNIOR OFFICERS SALUTE SENIOR WHEN MEETING, PASSING NEAR, WHEN ADDRESSING OR BEING ADDRESSED

OFFICERS AND ALL ENLISTED MEN NOT IN FORMATION SALUTE DURING HONORS TO THE FLAG OR PLAYING OF NATIONAL ANTHEM

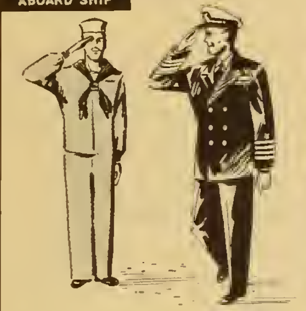
WHEN SEVERAL OFFICERS ARE SALUTED, ALL SHALL RETURN IT

WHEN OVERTAKING A SENIOR THE SALUTE SHALL BE GIVEN WHEN ABREAST, WITH "BY YOUR LEAVE SIR"

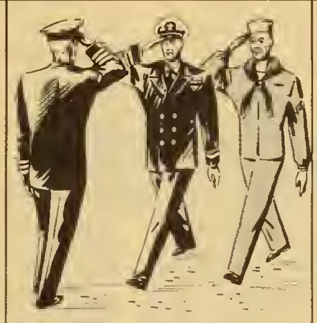
WHEN REPORTING(COVERED)

GUARDS SALUTE ALL OFFICERS PASSING CLOSE ABOARD

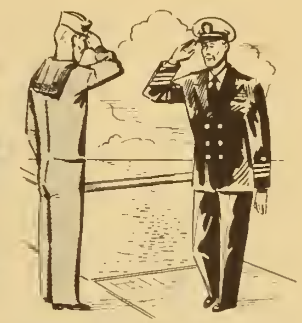
ABOARD SHIP



ON EVERY OCCASION SALUTE THE CAPTAIN, OFFICERS SENIOR TO HIM, SENIOR OFFICERS FROM OTHER SHIPS

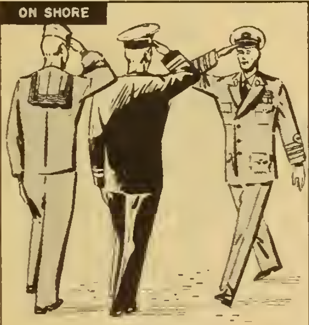


ON FIRST DAILY MEETING ENLISTED MEN SALUTE ALL OFFICERS, JUNIOR OFFICERS SALUTE SENIOR

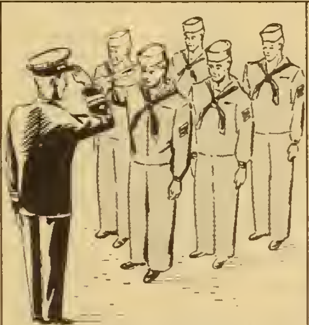


SENTRIES AT GANGWAYS SALUTE ALL OFFICERS GOING OR COMING OVER SIDE, PASSING CLOSE ABOARD

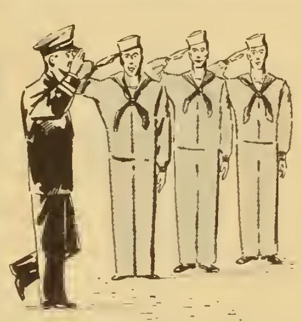
ON SHORE



MEN AND OFFICERS SALUTE ALL SENIOR U.S. AND ALLIED OFFICERS THEY MAY ENCOUNTER

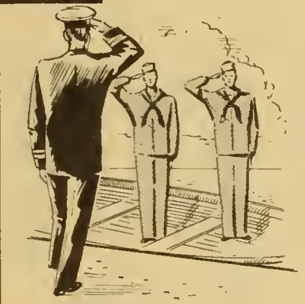


WHEN OFFICER MEETS DETAIL ASHORE OR AFLOAT, MAN IN CHARGE SALUTES FOR DETAIL

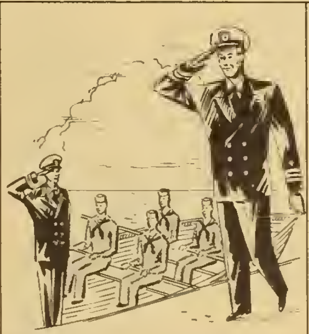


UPON APPROACH OF OFFICER, ONE CALLS ATTENTION, ALL SALUTE

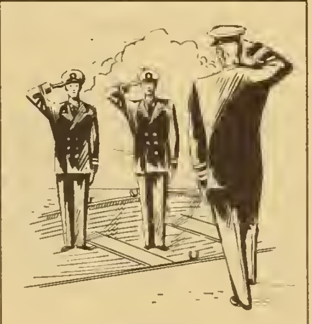
IN BOATS



ENLISTED MEN RISE AND SALUTE WHEN AN OFFICER ENTERS OR LEAVES

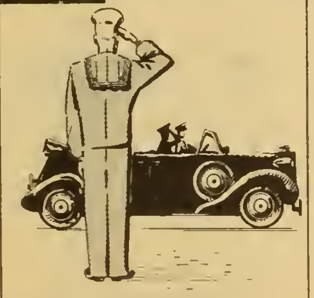


WHEN OFFICER PASSES NEAR, OFFICER OR PETTY OFFICER IN CHARGE SALUTES, IF NONE PRESENT MEN DO

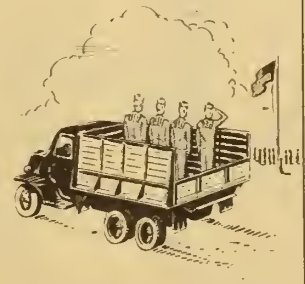


OFFICERS RISE AND SALUTE WHEN A SENIOR ENTERS OR LEAVES

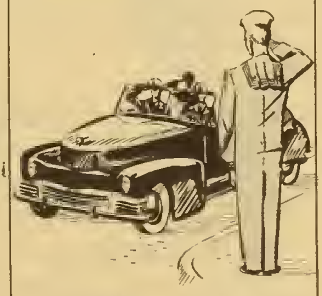
VEHICLES



RENDER SALUTES DUE THEM TO ALL OFFICERS IN VEHICLES (IF SAFETY PERMITS)



WHEN COLORS ARE SOUNDED MAN IN CHARGE OF DETAIL SALUTES: OTHERS AT ATTENTION



PASSENGERS IN CARS RENDER AND RETURN SALUTE (DRIVER: NO, IF SAFETY IS INVOLVED)

3. *In Buildings Ashore.* In Navy buildings ashore, the same general rules of saluting apply as on board the Navy's ships at sea: Salute the captain and all officers senior to him on all occasions; salute other officers on first daily meeting.

4. *In Civilian Clothes.* In peacetime, seniors should be saluted (when recognized) while wearing civilian clothing; in wartime, officers wearing civilian clothing are doing so, generally, because of an official reason for not disclosing their naval identity. Therefore, one should be discriminate about following the peacetime rule.

5. *In a Group.* If enlisted men or officers are standing together and a senior officer approaches, the first to perceive him says, "Attention!" and all face him and salute.

6. *Women.* When escorting women, both officers and men render the customary salute, if covered, when they meet other officers and men who are either alone or also escorting women. Seated with women, junior officers, if covered, rise and salute when senior officers approach. One salutes a woman acquaintance on the street. If remaining to talk to her, one does not uncover. When leaving her, one salutes again.

Naval courtesy is based on assumptions that sometimes differ from those in civilian life. For instance, headgear is considered an essential part of the military uniform and should not be removed when a man is outdoors except for divine worship and for other religious services. Even at funerals officers in uniform normally remain covered, and at appropriate moments they salute rather than uncover. At funerals when in civilian clothes, however, officers follow etiquette prescribed for civilians.

7. *Overtaking.* No junior should overhaul and pass a senior without permission. When for any reason it becomes necessary for the junior to pass, he does so to the left, salutes when abreast of the senior, and asks. "By your leave, sir?"

8. *Reporting.* When reporting on deck or out-of-doors ashore, one is covered and salutes accordingly. When reporting in an office, he uncovers upon approaching the senior, and therefore does not salute.

9. *Seated.* An enlisted man being seated and without particular occupation rises upon the approach of an officer, faces him and salutes, if covered. If both remain in the same general vicinity, the compliments need not be repeated.

10. *Seniority Unknown.* In most cases officers will know the relative seniority of those with whom they are in frequent contact, but there are many situations, especially ashore, where that is an obvious impossibility. Perhaps the safest advice is, at such times, to salute mutually and without delay. As a matter of fact, in practically every case where uncertainty exists, regardless of grade, the only rule to follow is to render the salute.

11. *Sentries.* Sentries at gangways salute all officers going or coming over the side, and when passing or being passed by officers close aboard in boats, or otherwise.

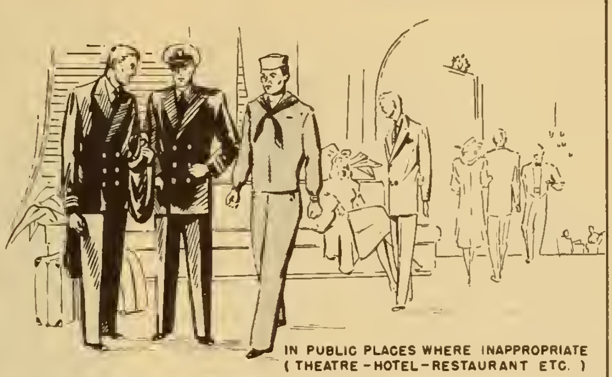
12. *Vehicles.* Enlisted men and officers salute all senior officers riding in vehicles, while those in the vehicle both render and return salutes, as may be required. As the driver of a vehicle, one is obliged to salute if the vehicle is at a halt; to do so while the vehicle is in motion might endanger the safety of the occupants and so it may be omitted.

When Not to Salute

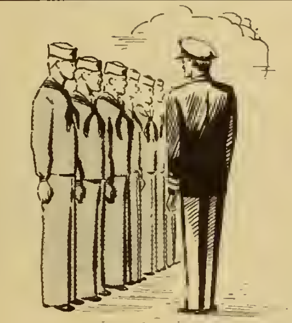
There are some situations in which it is improper to salute. These are as follows:

When uncovered, except where failure to salute might cause embarrassment or misunderstanding.
In ranks. (When addressed, come to attention only.)
On work detail. (Man in charge of detail, however, salutes.)
When engaged in athletics or assembled for recreation or entertainment.
When carrying articles with both hands, or otherwise so occupied as to make saluting impracticable.
In public places where obviously inappropriate (as theaters, restaurants, etc.).
In public conveyances.
When a member of the guard engaged in performance of a duty which prevents saluting.
In action or under simulated combat conditions.
At oars in a pulling boat.
At mess. (When addressed, correct procedure is to sit at attention.)

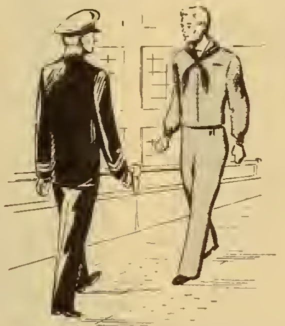
WHEN NOT TO SALUTE



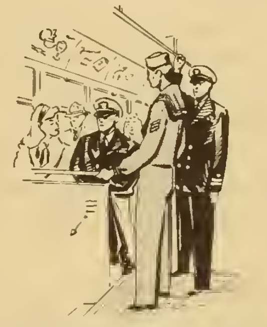
IN PUBLIC PLACES WHERE INAPPROPRIATE
(THEATRE - HOTEL - RESTAURANT ETC.)



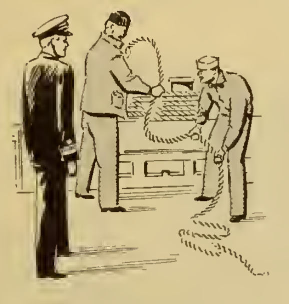
WHEN IN RANKS
(IF ADDRESSED, COME TO ATTENTION)



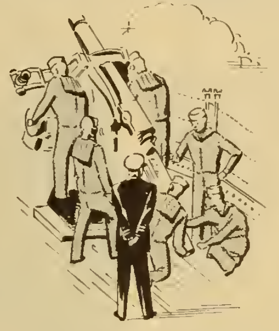
WHEN UNCOVERED AND IN INNER
COURT OR OPEN PASSAGEWAY
BETWEEN WINGS OF BUILDINGS



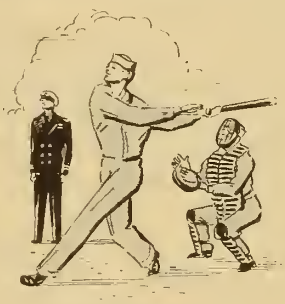
IN PUBLIC CONVEYANCES
WHEN OBVIOUSLY INAPPROPRIATE



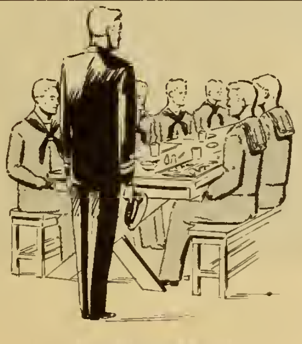
WHEN PART OF A
DETAIL AT WORK



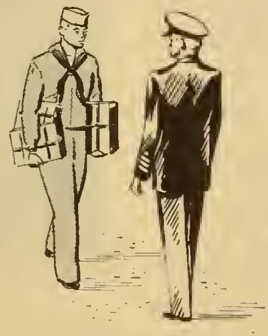
WHEN UNDER ACTUAL OR
SIMULATED BATTLE CONDITIONS



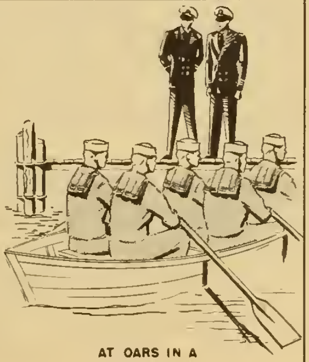
WHEN ENGAGED IN
GAMES OR ATHLETICS



AT MESS (IF ADDRESSED BY AN
OFFICER, SIT AT ATTENTION)



WHEN CARRYING ARTICLES
WITH BOTH HANDS



AT OARS IN A
PULLING BOAT

Salute Accompanied by a Greeting

The hand salute, under naval custom, is accompanied by a word of greeting. The junior holds himself erect, looks the senior straight in the eye and addresses him, depending upon the time of day, as follows:

From first rising until noon—
"Good morning, . . ."
From noon until sunset—
"Good afternoon, . . ."
From sunset until turning in—
"Good evening, . . ."

It is preferable to call the senior by his title and name, i.e., "Commander Jones"; "Mr. Smith" (if rank is below commander); "Chaplain Wilson," etc., rather than by the impersonal "Sir."

The use of a word of greeting to accompany the salute is a Navy custom, although some Army personnel also follow it.

Hand Salute on Other Occasions

In addition to the salute rendered to persons, naval personnel also salute the national ensign, the national anthem, and the quarterdeck.

1. *National Ensign.* All officers and enlisted men when reaching the quarterdeck either from a boat, from the shore, or from another part of the ship salute the national ensign. In the event the ensign is not hoisted this salute is tendered only when leaving or coming on board ship.

In making this salute, which is entirely distinct from the salute to the officer of the deck, a person stops at the top of the gangway, or upon arriving at the quarterdeck, faces the colors and renders the salute, after which he also salutes the officer of the deck. In leaving the quarterdeck, the same salutes are rendered in reverse order. The officer of the deck returns both salutes, and it is his duty to require that they be properly made.

The commanding officer clearly defines the limits of the quarterdeck to embrace as much of the main or other appropriate deck as may be necessary for the proper conduct of official and ceremonial functions. When the quarterdeck so designated is forward and at a considerable distance from the colors, the salute to the colors is not rendered by officers and men except when leaving or coming on board the ship.

2. *National Anthem.* Whenever the national anthem is played, all officers and enlisted personnel of the Navy:

(a) Stand at attention facing the music unless at colors when they face the ensign.

(b) If in uniform, covered, they salute at the first note of the anthem, retaining the position of salute until the last note of the anthem.

(c) If not in uniform, they uncover at the first note of the anthem, holding the headdress over the heart and so remain until the last note. If weather is inclement, the headdress may be raised slightly and held above the head.

The above rules apply only to a formal rendition of the national anthem. For example, if a man in uniform were walking past a radio store and heard "The Star-Spangled Banner" being broadcast, he would not be expected to stop, face the music, and salute. On the other hand, at a public gathering where the anthem was broadcast as part of the ceremony, he would render the required honors.

SALUTE RENDERED TO THE OFFICER OF THE DECK
Officers of the USS *Alabama* salute the OOD as they leave the ship for shore leave.

BURIAL AT SEA
Officers and men remain covered throughout the service.

The same mark of respect prescribed for observance during the playing of our national anthem is shown toward the national anthem of any other country formally recognized by the Government of the United States.

When in ranks salute only by command. In boats, only the boat officer, or, in his absence, the coxswain stands and salutes upon the playing of the national anthem; other members of the crew and passengers who are already standing, stand at attention; all others remain seated.

3. *Quarterdeck.* It has been noted in the previous discussion that the salute to the quarterdeck is rendered when leaving or coming on board ship, whether or not the colors are hoisted. For example, if you were coming aboard ship at midnight, the ensign would not normally be hoisted, but a salute would be rendered just the same. In ancient times Greeks and Romans placed their pagan altar on the quarterdeck; in the Middle Ages the shrines of the Virgin were placed aft in the same location; and today the national ensign is found there. The quarterdeck has always been the honored, ceremonial part of the ship and it has retained its sanctity. Respect is paid to it in the form of the hand salute and in other ways.

4. *Military Funerals.* During funerals, officers and men remain covered while in the open and uncover upon entering the church. During burial at sea, they remain covered throughout the service.

During religious services topside aboard ship and during formal religious ceremonies outdoors ashore (such as Easter sunrise service), officers and men remain uncovered throughout the entire ceremony.

In general, a military man uncovers during a religious ceremony but remains covered during a military ceremony. Church services, civilian funerals or burial services which the officer or man attends as a friend or relative rather than as a representative of the Navy, are religious ceremonies. Military funerals and burial at sea are regarded as primarily military ceremonies.

At a military ceremony when the occasion requires, an officer or enlisted man salutes rather than uncovers, as that is his traditional mark of respect. If an officer were attending a military funeral officially, he would salute whenever honors are rendered. Honors are rendered when the body is removed from the hearse to the chapel, from the chapel to the caisson, and from the caisson to the grave. They are also rendered when the volleys are fired and when "Taps" is sounded. However, as a participant at a nonmilitary funeral or burial service, he may, if he wishes, follow the civilian custom and uncover (rather than salute) when such honors are called for, as during the procession to the grave, the lowering of the body, and so on.

It should be noted that Jewish custom calls for remaining covered during all religious ceremonies and that therefore the rules regarding uncovering as stated above do not apply when the service is being conducted by a representative of that faith.

Types of Salute

The main types of salute are: the hand salute; the rifle salute, at order arms; the rifle salute, at right shoulder arms; and the rifle salute, at present arms. Another type of salute is "Eyes right" given by men in ranks, when passing in review.

ETIQUETTE ASHORE

Miscellaneous Situations

The question is sometimes asked: How do you greet civilians—by the salute, or otherwise?

The military salute is the mark and privilege of the military man. It is used in lieu of tipping the hat to women and it may be used to greet civilian males.

Raising the hat is an unmilitary custom which vanished when it was decreed that the salute to the flag and to superiors should be the hand salute. *Naval Customs, Traditions and Usage* says: "Since standing at attention and rendering the hand salute is the highest respect that one pays the colors of the Commander in Chief of the Navy afloat or ashore, it should suffice for the meeting with gentlemen or ladies in the open."

The procedure of getting into an automobile is the same as that of getting into a boat—juniors first in, last out. The junior takes his seat properly to the left. A lieutenant and a captain getting into an automobile would get in in that order, with the lieutenant taking the seat in the far, or left-hand corner, and the captain on the right. When getting out, the captain would leave first. In entering buildings or rooms, however, the junior opens doors for the senior and enters last.

The junior always walks on the left. The custom of the "right hand rule" is an old one, quaintly expressed by George Washington in his 30th "Rule of Civility," which said: "In walking, the highest place in most countries seems to be on the right hand, therefore, place yourself on the left of him whom you desire to honor."

Passing through the halls of a building, you may remove your cap or leave it on, as you choose. The cap is removed, of course, upon entering an office or any other room.

FUNERAL SERVICE ON GUADALCANAL
During military funerals, officers and men remain covered while in the open. (They uncover on entering church.)

RELATIONS OF SENIORS AND JUNIORS

Foundations of Naval Courtesy

The phase of military courtesy which covers relations among officers and between officers and men undergoes little change during a war, probably because these relations are the most fundamental part of all military courtesy and the main source of most naval etiquette.

The twin foundations of military courtesy among officers are: (1) precedence and (2) deference to seniors. Officers take precedence according to their rank, and this precedence is not confined to strictly military relations on ship or shore, but extends to the mess, to the club, and to social life.

Naval Courtesy Based on Usages of Polite Society

Naval courtesy prescribes that junior officers accord their seniors certain indications of deference and respect which correspond to those which younger men would accord to their elders under the usages of polite society. It also prescribes that seniors shall, with equal punctiliousness, acknowledge and respond to these tokens of respect required of juniors, so that there exists no semblance of servility in the interchange, but rather a sort of ritual for observance by those serving their country in a strictly ordered fraternity of Military Service.

Suggestions for Juniors

A junior officer approaching a senior for the purpose of making an official report or request maintains an attitude of military attention. He does not take a seat, or smoke, until invited to do so. Some have brought up the question: Is it correct when with a senior to say, "Do you mind if I smoke, sir?" Under some circumstances it may be, but when with the captain, it is certainly incorrect. And for anything approaching official relations, the choice has been rather precisely expressed by one writer: The invitation should be "awaited" rather than "anticipated."

Unless on watch, a person in the Naval Service always uncovers when he enters a room in which a senior is present.

Unless it has been otherwise directed, when a senior enters a room in which junior officers or enlisted men are seated, the one who first sees him orders "Attention." All present remain at attention until ordered to carry on.

Similarly, when a junior or enlisted man observes his group being approached by a senior (except at work or meals) he calls, "Attention." Those present remain at attention until the senior makes the gesture or says, "Carry on." If addressed by a senior, a junior should, if seated, rise and remain at attention. Men seated at work, at games, or at mess are not required to rise when an officer, other than a flag officer or the captain of the ship, passes, unless they be called to attention or when it is necessary to clear a gangway.

The place of honor is on the right. Accordingly, when a junior walks, rides or sits with a senior, he takes position alongside and to the left. When officers pace to and fro, however, positions are not changed; the junior keeps step with the senior. On board ship, the senior is generally afforded the outboard position. The junior opens doors for the senior and enters last.

At parties, where the captain is present, it is not

FOUNDATIONS OF MILITARY COURTESY
Precedence and deference to seniors are the twin foundations of military courtesy. Officers take precedence according to their rank in their military relationships, in the mess, in the club, and on social occasions.

considered good taste to leave before he does. If necessary to do so, respects are paid to him before departing.

Never offer to shake hands with a senior; he should make the first gesture. It is, however, considered good form to offer your hand to officers and men junior to you upon being introduced.

A junior avoids keeping a senior waiting. Punctuality is essential in the Service. When called by a senior, a junior responds on the double. A junior should recognize the tremendous importance of keeping all appointments, particularly with seniors.

In replying to questions from a senior, a junior avoids a great deal of embarrassment to himself, as well as to the organization in which he serves, by giving complete and explicit answers. If the junior does not know and cannot give a complete or correct answer, he must be honest and direct about it in his reply. He answers only as much of the question as he can without evading and misinforming. For example, a good honest, "I don't know, sir, but I will find out and let you know," is a much better answer than an indirect one that conveys misinformation on which a senior may be basing an important decision. To avoid admitting ignorance, juniors sometimes make evasive statements which not only seriously affect their service reputation but also confuse the issue.

It is an excellent practice for a junior who has been ordered to do an assigned task to report back promptly to the senior either the completion of the task or exactly what has been done about its completion.

When given an order, a junior does not ask how to carry it out but studies the task. If advice is needed, he turns to his brother officers, but not, unless unavoidable, to the one who gave him the order. He anticipates the wishes of his senior, whenever possible.

An officer should not jump the chain of command. In other words, he does not consult anyone higher in that chain than his immediate superior without first being given authority by him to do so.

An Order and a Command

It is well at this point to differentiate between an order and a command. An *order* gives a junior a job to be done and leaves with him the responsibility for determining the manner in which it is to be done. It does not always specify the exact time that it shall be executed but frequently fixes a time limit. A *command* directs a specific action, without alternatives. "Commence firing!" and "Attention!" are commands. When an officer tells the chief boatswain's mate to have the captain's gig painted by the end of the week, he has given an order; when he tells the boatswain's mate on watch to pipe sweepers, he has given a command.

By custom and tradition of the Service, a senior's expressed wish or desire is the same as an order.

Social Calls

Aboard Ship. Though officers reporting aboard ship or at a naval station may see the commanding officer or commandant in person, they must also make a visit of courtesy to him within 48 hours. They should consult the executive officer as to when the courtesy visit will be most convenient, and they may learn that the commanding officer, owing to demands on his time and energy, has left orders that courtesy visits are temporarily discontinued. During a war, pressures are so great that courtesy calls are almost universally cancelled.

Officers making courtesy visits should never settle back for a long conversation but should remain for

THE APPROPRIATE GESTURE
All civilians who are entitled to gun salutes and other honors are also entitled to the hand salute. Here a former Secretary of the Navy stands bareheaded as he is "piped" aboard.

only ten minutes unless requested to remain longer. They should try to be attentive and polite but not servile or wooden, and though they should allow their host to direct the conversation, they should try to add more to it than simple affirmatives and negatives. It would be wise to refrain from asking leading questions about their new duty, about military problems facing their host, or about intimate details concerning his private life.

Because of a natural timidity, young officers sometimes show a regrettable lack of confidence and decision when the time comes for them to go. Those who are unable to rise, excuse themselves, and leave promptly and gracefully indicate that they have not had much social training and consequently make an unfortunate impression.

At Home. The social call which a junior officer attached to a small unit ashore must make on his senior officer in his home gives an opportunity for better mutual understanding. A junior may learn a lot about his senior's interests and hobbies which could not be known if the two maintained only the formal relations necessary when they are on duty. A senior taking pleasure in the interest a junior shows in his conversation relaxes and sets an informal note, and, for the time being, rank is relegated to the background. A good officer is also a human being, a man eager to be liked, understood, and approved of, and as a host, he can be more gracious and informative than when on duty. There, to his juniors, seeing him always meticulously dressed, following a set routine, acting briskly and efficiently, adhering strictly to *Navy Regulations*, he may seem only distant and severe. A superior officer playing the role of a thoughtful host in his home can understand his guest's feelings—he has been through the same ordeal himself in his younger days—and can do much to make him feel at ease. The first social call should be limited to a half-hour.

An officer invited to dinner should take particular pains to be punctual and to leave before his welcome has worn out. It is not necessary to stay all afternoon or evening. A visit of from three-fourths to one hour after a meal is all that courtesy demands, and one should excuse himself within this time unless urged to remain. If there is present a guest of honor who is not a house guest, other guests should await her or his departure, if possible.

An officer invited to dinner is expected to do more than merely eat appreciatively. He is expected to contribute some engaging and intelligent conversation, which requires among other things familiarity with current events and an interest in national and world affairs as well as with incidents of merely local import. He should be careful, however, not to indulge in long-winded monologues or to monopolize the conversation, and he should be sensitive to his host's wishes about topics to be discussed.

Though it may seem unjust to a courageous and able naval officer that many important persons may judge him by his table manners, it is nevertheless a fact almost universally accepted in the civilized world that crudeness at meals may do much to mar a career which otherwise might be distinguished.

Good manners are based on a reasonable deference first to one's hostess and second to her guests. Though the finer points of etiquette, if not taught early in life until they become almost second nature, must be learned by close observation and experience, some of the basic principles underlying correct deportment in a dining room may be suggested.

Sit erect with head elevated. Wait for your hostess to be served before you begin to eat. Start with the outside fork and work inward. Speak and eat quietly. Give others ample opportunity to talk. Bring up pleasant and amusing topics for conversation. Be careful to finish each course with the others. Use the napkin and fingerbowl discreetly.

All the world over, guests who stand in the open front door to prolong a conversation or begin a new one and in winter allow the cold to chill off the house or in summer the heat and flies to come in show that they have insufficient social imagination and breeding. When guests have made preparations to leave, they should do so, with a minimum of delay and a maximum of grace, which would include of course a nicely turned phrase indicating appreciation for the host's hospitality.

Addressing Seniors

There is only one proper response to an oral order —"Aye, aye, sir" (or to a woman, "Aye, aye, Lieutenant," or whatever the rank may be). It means, I understand and will obey. Such responses to an order as "O.K., sir," "All right, sir," or "Very well, sir," are taboo. But "Very well" or "Very good" is proper when spoken by a senior in acknowledgment of a report made by a junior.

The word "sir" should be employed as a prefix to an official report, statement, or question addressed to a senior. It should also be used when addressing an official on duty representing a senior. For example, the officer of the deck, regardless of rank, represents the commanding officer, and should be addressed as "sir."

A junior addressing a senior should introduce himself unless certain that the senior knows him by sight.

There are certain differences in phrasing which should be noted: A senior officer sends his "compliments" to a junior. For example, "Admiral Smith presents his compliments to Captain Brown and says," etc. A junior never presents his compliments to a senior, but sends his "respects." When making a call upon a commanding officer, one is correct in saying, "Captain, I came to pay my respects," or to say to the orderly before entering the cabin, "Tell the captain that Ensign Jones would like to pay his respects."

In written correspondence, a senior officer may "call" attention to something, but a junior may only "invite" it. A junior writing a memorandum to a senior subscribes it "Very respectfully"; a senior writing to a junior *may* use "respectfully."

Conduct Ashore in Foreign Countries

When ashore in uniform in foreign countries, an officer or student officer will do well to remember that his conduct will be considered as representative of the conduct of all members of the Naval Service. He must scrupulously respect the laws and customs of any foreign country. Infractions of a seemingly unimportant nature, even though committed unwittingly, arouse resentment and may result in serious complications. Under no circumstances should an officer enter into an altercation or argument with anyone abroad. In case of trouble of any nature, the officer should refer the matter to a consular officer or a diplomatic representative of the United States, or he should communicate with his ship.

Customs Regulations

United States customs regulations are very specific in stating that exemption from payment of duty of articles purchased abroad covers only articles intended for personal use of the returning traveler. The term *personal use* as used in the regulations is intended to cover articles purchased with the traveler's own money, either for his own use or as a gift to others. The importation of large quantities of material under any agreement which permits transfer of goods after importation is an evasion of the regulations, and offenders are liable to heavy fines as well as to imprisonment. An accurate record of purchases made abroad should be kept so that a correct customs declaration can be made. The prices actually paid for articles purchased abroad, either in the currency of the country where purchased or the equivalent in United States currency, must be stated in the customs declaration. Fair values must be given for all articles obtained abroad otherwise than by purchase, such as gifts.

CHAPTER 4

NAVAL COURTESY AND CUSTOMS—Part II

COURTESY TO WOMEN

Women in Uniform

In most cases the questions of courtesy brought up by the presence of women in the Military Services are solved simply: The rules of military courtesy apply and rank takes precedence.

Since military courtesy also includes deference to women and since a senior's wish is also an implied command, there may be occasions when a senior male officer will indicate that he prefers courtesy to women above strict military usage. In such a case, the junior woman acts accordingly without any hesitation or embarrassing counter-deference.

Walking with Women

When walking with a woman, you should give her the same place of honor you would give a senior officer—on your right. It has also been a custom for many years for the man to take the outside of the walk, although the reasons for this are by now somewhat outdated.

In the days when there was more likelihood of being splashed by mud with carriages dashing by, it was a normal and reasonable courtesy for the man to take the outside and thus provide shelter. It was also a protection to the woman when passing horses reared, bucked, or swerved in their course.

Although there is no longer much justification for this precaution, the custom has remained, so it is just as well to observe it rather than seem to be withholding a common courtesy. The positions on the outside or on a woman's left are both perfectly correct.

When walking with a woman, one offers his arm only when assistance is appropriate, such as when there is a real necessity of assisting her through crowded traffic or over rough ground or other impediment.

When walking with more than one woman, a gentleman traditionally takes his position on the outside, not in the middle. This custom, however, cannot be binding since its main justification went out with the horse and buggy.

If there are two men and one woman, the woman walks between them.

With women in uniform (upon social rather than military occasions), a different problem arises: Do you, if you are senior, take the inside or right-hand position? Or do you, as a gentleman, accord that courtesy to the woman? On social occasions, social customs prevail. Dinner-and-the-movies is no place for rank.

Courtesy in Public Vehicles

In street cars and buses, the question of whether you rise and give your seat to a woman is not so much a matter of military courtesy as it is just a matter of courtesy. Although a man is not required to give up his seat he should not go on the theory that being in uniform has absolved him from normal requirements of courtesy. Any courtesy extended by a man in uniform reflects favorably not only on him but also on the Naval Service as a whole.

Courtesy in Elevators

More and more it is becoming the custom for men not to remove their hats when in an elevator with women. One frequently finds in public elevators signs reading, "Please do *not* take off your hat." This change obviously is to conserve space. It may nevertheless become a problem to know what to do if others take off their hats when a woman enters. Although one would be correct in keeping the cap on, it might prove embarrassing. The common-sense thing would be to follow the example of the others for one's peace of mind, which depends on offering all courtesies offered freely by others.

Saluting Women

The same regulations for salutes apply to women as to men except indoors where men are customarily uncovered—for examples, in a theater or in a church. Under these circumstances women do not salute even though wearing hats.

FORMS OF ADDRESS; QUARTERDECK, WARDROOM, AND BOAT ETIQUETTE

Forms of Address and Introduction

Although military customs generally predominate, there are some slight differences in methods of addressing and introducing military personnel, according to whether you are in civilian or military circles at the time.

Naval officers with the rank of commander or above, in both line and staff, are always addressed and introduced by their titles. Those with the rank of lieutenant commander or below are generally addressed and introduced in military circles as "Mr. ——."

Officers of the Medical Corps are addressed by their titles if commander or above, while those of the rank of lieutenant commander or below are addressed as "Dr. ——." However, if a senior officer of the Medical Corps prefers to be addressed as "Dr." rather than by his military title, such preference should of course be honored. Officers of the Nurse Corps are addressed by their titles, if commander or above. However, some women in the Nurse Corps of the rank of commander or captain prefer to be addressed as "Miss" or "Mrs." rather than by their military titles. Such preference should also of course be honored.

All chaplains are properly addressed as "Chaplain" regardless of their rank.

A woman captain or commander should be introduced by title. Below the rank of commander, "Miss" or "Mrs." is used for both introduction and address. When the marital status of a woman officer is not known, use the title of her rank in addressing her.

A chief warrant officer or warrant officer is never addressed as "Chief." He is always called "Mr. ——." A midshipman is also addressed and introduced as "Mr. ——."

In general, it is preferable to call a senior by his title and name, that is, "Commander Doe," or "Mr. Wilson," rather than by the impersonal "sir." In prolonged conversation, where the repetition of this would seem forced or awkward, the shorter "sir" is naturally used more often.

The correct response to a question from a woman officer of the rank of commander is "Yes, Commander," or below that rank, "Yes, Miss Brown," or if the name is not known, "Yes, Lieutenant," "Yes, Ensign," as the case may be. The Navy Department has not authorized the use of "ma'am" or "sir" in addressing woman officers.

In any naval organization, there is only one captain, the regularly assigned commanding officer, who may be addressed as "Captain," regardless of his rank. There is also only one commander, the regularly assigned executive officer (if of the rank of commander), who may be addressed as "Commander," without appending his name. However, the present tendency is to address the executive officer as "Commander" even though his rank is that of lieutenant commander. In actual practice, the use of "Captain" or "Commander" without the name is frequently heard ashore, where more of those ranks are regularly encountered than would normally be found on any ship.

Addressing a lieutenant commander as "Commander," for short, has no foundation in naval etiquette nor should it be mistakenly used as a form of courtesy to the officer concerned. Navy usage differs

HOW TO ADDRESS AND INTRODUCE NAVAL PERSONNEL

Person addressed or introduced:	To Military Personnel		To Civilians	
	Introduce as:	Address as:	Introduce as:	Address as:
Naval Officer (Cdr. or above)	Captain (or appropriate rank) Smith	(same)	Captain Smith[1]	(same)
Naval Officer (Lt. Cdr. or below)	Mr. (Mrs., Miss) Smith	(same)	Lt. Cdr. Smith[2]	Mr. (Mrs., Miss) Smith
Medical Corps Officer (Cdr. or above)	Commander Smith[3]	(same)	Commander Smith	(same)
Medical Corps Officer (Lt. Cdr. or below)	Dr. Smith	(same)	Lt. Smith, of the Naval Medical Corps	Dr. Smith
Chaplain Corps Officer	Chaplain Smith	(same)	Chaplain Smith	(same)
Navy Nurse Corps Officer (Cdr. or above)	Commander Smith	Miss (or Mrs.) Smith	Commander Smith, of the Navy Nurse Corps	Miss (or Mrs.) Smith
Navy Nurse Corps Officer (Lt. Cdr. or below)	Miss (or Mrs.) Smith	(same)	Lt. Smith, of the Navy Nurse Corps	Miss (or Mrs.) Smith
U. S. Public Health Service Officer (M.D. or dentist)	Dr. Smith[4]	(same)	Dr. Smith, of the Public Health Service	Dr. Smith
U. S. Public Health Service Officer (Sanitary Engineer)	Mr. Smith	(same)	Mr. Smith, of the Public Health Service	Mr. Smith
Commissioned Warrant Officer	Mr. Smith	(same)	Warrant Officer Smith	Mr. (or Miss) Smith
Midshipman	Mr. Smith	(same)	Midshipman Smith	Mr. Smith
Warrant Officer	Mr. Smith	(same)	Warrant Officer Smith	Mr. (or Miss) Smith
Chief Petty Officer	Chief Yeoman Smith	Smith	Chief Yeoman Smith	Mr. (or Miss) Smith
Aviation Cadet	Aviation Cadet Smith	Mr. Smith	Aviation Cadet Smith	Mr. Smith
Petty Officer	Use name and rate, as: Smith, Yeoman 2	Smith	Yeoman Smith or Petty Officer Smith	Mr. (or Miss) Smith
Seaman	Seaman Smith	Smith	Seaman Smith	Mr. (or Miss) Smith

[1] When not in uniform a captain or lieutenant would be introduced as "of the Navy" to distinguish the rank from the similar-sounding Army one.

[2] A suggested form of introduction is: "This is Lt. Cdr. Smith. Mr. (Mrs., Miss) Smith is now stationed here." This indicates both (a) the officer's rank and (b) the form of address.

[3] If a senior officer of the Medical Corps prefers to be addressed as "Dr.," such preference should be honored.

[4] In any case where you had reason to believe the doctor's insignia might not be recognized, it would be correct to add "—of the Public Health Service" in introducing him.

from the Army, where a lieutenant colonel may be addressed as "Colonel."

The title of lieutenant commander was introduced in the United States Navy in 1862 with the reorganization of the Service. Previous to this time, all lieutenants in command of smaller men-of-war were called "lieutenant commanding," and so signed themselves. From this was derived the title of lieutenant commander.

A naval officer is introduced to civilians by his title, and the method of introduction should give the cue as to how he should be addressed from then on. If you were introducing an officer below the rank of commander, you might say, "This is Lieutenant Jones. Mr. Jones is an old shipmate of mine." This serves a double purpose; it gives the civilian to whom you are introducing an officer knowledge of the naval man's rank in the event he does not know it, and it also gives him the correct method of address, "Mr. Jones."

For woman officers, the procedure is the same as for male officers.

Because many people are not familiar with all Navy rank insignia and corps devices. it is usually a good idea to make an introduction, however brief, reasonably informative. A woman lieutenant or lieutenant commander may be introduced with the words, "This is Lieutenant Johnson. Miss Johnson is in the Nurse Corps"; or "This is Lieutenant Commander Jones. Miss Jones is on duty in the Navy Department."

The Navy today is a cross-section of America. In the same family, one man may be a machinist's mate and his brother a lieutenant. An ensign may have a sister who is a yeoman, and so on. General Pershing held the highest United States military rank, General of the Armies, but his son entered World War II as a private. The present Secretary of Defense entered World War I as a seaman second class.

Accordingly, even though the distinction between officer and enlisted personnel still exists in all formal and official relations, it does so less and less in non-military relations.

Military and civilian practices differ in introducing and addressing enlisted personnel. Under military conditions enlisted personnel are called by their last names. That is the customary and expected procedure. But in a social gathering, civilians would feel unnecessarily curt in addressing any enlisted man or woman by the last name alone.

It is customary therefore for those outside the Service to extend to an enlisted man or woman the same courtesies they would naturally have extended to them in civilian life and to prefix their names with "Mr.", "Miss", or "Mrs.", as the case may be. In introducing them, one should give the rating and name, then the mode of address, as "This is Machinist's Mate Smith. Mr. Smith will be visiting us for a while."

On the other hand, by a simpler procedure used by enlisted Army personnel, men are introduced by rank rather than by speciality: "Sergeant Jones," "Corporal Smith," "Private Hargrove," and so on. The nearest equivalent in Navy terminology would be the term "petty officer," and this could be used to provide a simple method of introduction: "This is Petty Officer Jones." Below petty officer, you would say, "This is Seaman Jones" or "Fireman Jones." They would thereafter be addressed as "Mr. Jones" or "Miss Jones."

Quarterdeck Etiquette

Unlike wardroom etiquette, quarterdeck etiquette remains the same in peace and war. It is well to remember when on the quarterdeck that this has always been the honored, ceremonial part of the ship and that it still retains its sanctity.

When an officer comes on board ship, he salutes the officer of the deck and says, "I report my return aboard, sir," if it is his own ship, or "I request permission to come aboard, sir," if visiting the ship. Upon leaving his own ship, the officer, as he salutes the officer of the deck, says, "I have permission to leave the ship, sir." If a visitor, the officer says, as he salutes, "With your permission, I shall leave the ship, sir."

The etiquette of the quarterdeck should be strictly enforced by the watch officer. The quarterdeck should be kept immaculate and its ceremonial character maintained. For officers and enlisted men alike, adherence to these rules is required:

1. Avoid appearing on the quarterdeck out of uniform.
2. Never smoke on the quarterdeck.
3. Avoid putting hands in pockets especially on the quarterdeck.
4. Avoid horseplay on the quarterdeck.

5. Never walk on the starboard side of the quarterdeck unless invited by the admiral or the captain.

6. Don't engage in recreational athletics on the quarterdeck unless it is sanctioned by the captain, and then only after working hours.

The starboard gangway to the quarterdeck is used by all commissioned officers, warrant officers, and their visitors; the port gangway is used by all others. If the construction of the ship or other circumstances make a change in this rule expedient, the change may be made at the discretion of the commanding officer. In heavy weather, the lee gangway is used by everyone.

The term *officer of the deck* is frequently misunderstood by newcomers in the Navy. He is the officer on watch in charge of the ship (normally on duty for four hours) and represents the captain. He is responsible for the safety of the ship, subject, however, to any orders he may receive from the captain. Every officer or other person on board ship, whatever his rank, who is subject to the orders of the commanding officer, except the executive officer, is subordinate to the officer of the deck.

It is important for the officer of the deck to know who is approaching his ship at all times. Small boats nearing a vessel at anchor at night are hailed by the sentries, gangway watch, or quartermaster with "Boat ahoy!" The boat coxswain returns the hail according to personnel aboard as follows:

"United States"—if the President of the United States is aboard.

"Navy"—if the Secretary of the Navy is aboard.

"Fleet"—if the Commander-in-Chief of the Fleet is aboard.

"Name of ship"—the ship's name is given indicating that its commanding officer is aboard.

"Aye, aye"—if a commissioned officer is aboard.

"No, no"—if a midshipman or warrant officer is aboard.

"Hello"—if an enlisted man is aboard.

"Passing"—boats not intending to come alongside, regardless of rank of passengers.

Honors to the Colors. Naval ships at anchor or moored hoist the national ensign at the flagstaff aft at 0800 and lower it at sunset. The union jack, likewise, is hoisted and lowered at the jackstaff forward at the same times. At colors, the national ensign is hoisted smartly, lowered slowly, and must never touch the deck. At both morning and evening colors, "Attention" is sounded, and all officers and men face the ensign and render the salute. At shore stations and, in peacetime, on board large vessels where a band is present, the national anthem is played during the ceremonies. In the absence of a band, a bugler, if available, sounds "To the Colors" at the morning ceremonies and "Retreat" at sunset formalities. (When a naval ship is underway, the jack is not hoisted, but the ensign is normally flown at the gaff.)

When a merchant vessel registered by a nation formally recognized by the Government of the United States salutes a ship of our Navy by dipping her national ensign, it must be returned dip for dip. No American naval ship dips her ensign, however, except in return for such a compliment.

In half-masting the ensign, one first raises it to the

ABOVE THE NATIONAL ENSIGN FLIES THE CHURCH PENNANT
The church pennant is flown while divine services are being held. It is the only emblem that may be flown above the national ensign.

THE WARDROOM
The wardroom is the commissioned officers' mess and lounge room. Here especially must the young officer remember the twin foundations of military courtesy—precedence and deference to seniors.

truck or peak and then lowers it to half-mast. Before being lowered from half-mast, the ensign is first raised to the truck or peak and lowered with the usual ceremonies.

In the large assortment of flags carried by American men-of-war, only one flies above the national ensign. It is the church pennant. We do not know when it was first flown by the Navy. It was, however, flown in 1842 on the United States brig *Somers,* during the religious services following the execution of the three men charged with attempted mutiny. In the words of Alexander Slidell Mackenzie, the Captain: "The colors were then hoisted, and above the American Ensign was raised the Banner of the Cross—the only flag that ever floats above it from any vessel under my command." It was also hoisted during the divine service on 26 April 1862 on Farragut's flagship, the *Hartford.*

Wardroom Etiquette

Like many other phases of naval courtesy, wardroom etiquette of necessity undergoes many changes in time of war. In the interest of completeness, perhaps the best approach to the subject would be to take up the generally prevailing rules of wardroom etiquette as they are in peacetime and then to give some of the variations that would be brought about by war.

In Peacetime. The wardroom is the commissioned officers' mess and lounge room. The main peacetime rules of its etiquette are:

1. Don't enter or lounge in the wardroom out of uniform.
2. Don't sit down to meals before the presiding officer does. (Exception: at breakfast.)
3. If necessary to leave before the completion of the meal, ask to be excused.
4. Always introduce guests to wardroom officers, especially on small ships.
5. Never be late for meals. If you are unavoidably late, make your apologies to the presiding officer.

6. Don't loiter in the wardroom during working hours.

7. Avoid wearing a cap in the wardroom, especially when your shipmates are eating.

8. Avoid being boisterous or noisy in the wardroom.

9. Don't talk shop continuously.

10. Pay mess bills promptly.

11. Gambling or drinking in the wardroom is a general court-martial offense.

12. Remember that the more experienced officers in the mess will respect a frank admission of ignorance, but that they will soon consider you inefficient if you assume a presumptuous attitude and continually make blunders.

13. In general, the young officer pursues the correct course by being the best listener in the mess.

14. Religion, politics, and women should not be discussed.

15. "Bulkheading" or expressing unfavorable comments and opinions about senior officers is not tolerated.

Good manners with a consideration for other members and their guests constitute the first principles to which all others are secondary.

The executive officer is the president of the mess. *Navy Regulations* prescribe the seating arrangement. Officers are assigned permanent seats at the table; alternately, in the order of rank, to the right and left of the presiding officer, except that the seat opposite that of the presiding officer is occupied by the mess treasurer. (Second ranking officer sits on the right of the presiding officer, third on the left, and so on.)

In Wartime. During a war, the routine of the wardroom is vastly different from that which has just

OFFICERS' WARDROOM

Scene in the officers' wardroom aboard a battleship in wartime. Wardroom etiquette in wartime is considerably different from the peacetime routine.

EVERY ACTIVITY HAS ITS OWN RULES OF ETIQUETTE
Customs and courtesy must be as strictly observed in a boat as they are in the wardroom. Definite rules govern the manner in which naval personnel enter, take seats in, and leave a boat.

been described. Regular mealtimes are out of the question during general quarters. If, before starting to eat, one always waited for the presiding officer to sit down, meals would be too irregular and delayed.

Many an officer who has served in wartime can report that, instead of dining in the wardroom, he has eaten sandwiches and coffee served topside whenever he could snatch a hasty bite, and that he has sometimes gone on like this for days at a stretch. A rule about never being late for meals is hardly binding under such circumstances.

Also, the custom of not talking shop is not practicable when war is the business of the day. Then, mealtime frequently provides an opportunity to exchange those little bits of information about experiences that increase the knowledge of all fighting men. Talking shop in wartime brightens conversation and may even help win the next battle.

Even the seating arrangements in wardrooms may undergo changes during a war. A ship may scatter her higher ranking officers among many tables rather than concentrate them at one place, where a chance enemy hit might wipe out all of them at once. It is sometimes the custom for men when eating in shifts to be cross-sectioned by rank among the various shifts, for the same reason.

In short, in peacetime, wardroom etiquette follows the old, established customs, but during a war, common sense and necessity combine to bring about changes.

The officers' mess is organized on a businesslike basis. There is a mess fund to which each officer must contribute his share on joining the mess. An officer receives a ration allowance from the Navy and it is a courteous gesture for him to ask the mess treasurer, within the first 24 hours aboard, for his mess bill and mess entrance fee and pay them at once. The monthly mess assessments defray the cost of food, periodicals, other essentials, and conveniences. This fund is administered by the mess treasurer, who is elected by the members. He must serve if elected, but is not required to serve longer than two months consecutively. His work involves the purchase of food, preparation of menus, and supervision of service. It is recognized as collateral duty, and attention is paid to it in the marking of an officer's report of fitness. As with all things, study and attention are required to do the job well. Some perform this task exceptionally well with full attention to balanced diets, light appetizing luncheons, and planning with the steward for new dishes and variety in menus. At the close of each month, the mess treasurer must render to the mess a statement of the accounts of the mess.

Boat Etiquette

Boat etiquette may be summed up by the following instructions:

1. Unless otherwise directed by the senior officer present, officers enter boats in inverse order of rank (juniors first) and leave them in order of rank (juniors last).
2. Always stand and salute when a senior enters or leaves a boat, unless as an enlisted man you have an officer or petty officer in charge to render the honors.
3. When a senior officer is present, do not sit in the stern sheets unless asked to do so.
4. The seniors are accorded the most desirable seats.
5. Always offer a seat to a senior.
6. When leaving ship, get in the boat a minute before the boat gong, or when the officer of the deck says the boat is ready—don't make a last-second dash down the gangway.
7. If the boat is crowded, juniors disembark and embark in the next one.
8. Juniors in boats take care to give seniors in boats plenty of room to move about.
9. A landing over another boat should not be made without permission, and permission to do so is not requested if it can be avoided.

RELATIONS OF OFFICERS AND ENLISTED MEN

Basis of Relations

An officer's relations with his men should be founded on mutual respect. An American bluejacket is on the whole intelligent, cooperative, and ambitious. He wants to be treated like a man and expects his abilities to be appreciated. He wants to like his officers—to admire them and to be able to brag about them to the men of other ships.

An inexperienced officer, in his relationship with his men, is likely to be hesitant and uncertain. He finds himself in an unfamiliar situation, among people who are strangers to him. By virtue of his commission he is placed in charge of enlisted personnel and this newly acquired authority is strange to him. He wants to be liked by his men, to know them as individuals, and yet maintain his rightful authority over them.

Personal dignity is a quality which the young officer must cultivate. It is that undefinable something possessed by certain leaders which enables them to converse at length with their men on casual and unofficial matters, and yet at the same time maintain that reserve which discourages the slightest tendency to familiarity.

However, consideration for enlisted men is always in order. For example, if an officer of the deck finds it necessary to send a boat crew away during meal hours, he should order the commissary steward, chief police petty officer, and ship's cook to save hot meals for them.

Avoiding Familiarity

Some new officers feel that they promote friendliness between themselves and their men by calling the men by their first names, or, worse still, by their nicknames. Nothing could be further from the truth. The men should be addressed by their last names and only by their last names.

An officer should never permit enlisted men to visit him in his room or in the wardroom country unless the matter is extremely urgent. He should arrange to see them in his department office or in his part of the ship.

As pointed out in Chapter 7, *Navy Regulations*

CAPTAIN'S INSPECTION
The commanding officer leads his inspecting party past the crew's ranks on the forecastle of USS Missouri.

absolutely forbid financial transactions between officers and enlisted men.

Treatment of Stewards

Stewards are in charge of the wardroom, pantries, galley, and officers' rooms. Most of them are Negroes, although there are a number of Chamorros (natives of Guam) and Filipinos. Since they are constantly in rather close contact with officers and have frequent occasion to be in the wardroom and in officers' rooms, there is a tendency to become too familiar with them, or perhaps, at times, to be brusque with them. An officer should always be tactful in his dealings with stewards. If an officer feels that a complaint is in order or disciplinary action is necessary, he should deal directly with the mess treasurer who has charge of the stewards.

Tipping of stewards—or any other enlisted man—is forbidden by implication in the article of *Navy Regulations* which forbids financial transactions of any sort between officers and enlisted personnel.

Conclusion

In conclusion, it should be pointed out that the relation between officers and men is founded upon the same mutual respect as that between fellow officers. The measure of respect which an officer inspires in his men is the measure of that officer as a man and a sailorman; his sincerity; his sense of justice; his interest and concern for his men's welfare; his dignity and bearing; his firmness and consistency in requiring obedience to his own, or the captain's orders; and his interest in and knowledge of his profession. It is well to study constantly the methods of officers who are experts in handling enlisted men in order to learn their technique.

HINTS TO JUNIOR OFFICERS

Excuses for failure or negligence are generally unacceptable. An officer should assume responsibility and not depend on alibis. He should freely accept the blame if the failure is his.

A phrase in common use at the Naval Academy is "greasing," indicating servility, or *bootlicking*, a deliberate courting of favor. It has no place in a naval officer's life and should be avoided. It may be temporarily mistaken for a sincere desire to please and to make good but in time seniors through long experience with such matters will recognize it as "greasing." However, a sincere desire to be friendly and cooperative is essential to a junior officer's success in his naval career. A continued willingness to undertake any task assigned and perform it cheerfully and efficiently will in time gain for the young officer a reputation for dependability and insure his popularity with his fellow officers; continued grouching and loafing will have exactly the opposite effect. When an officer has done a job to the best of his ability, he should be content with the satisfaction this fact gives him and not run to his superior to tell him he has done so and so. Of course when a report is in order it should be made. The fact that work is well done generally reaches the attention of superiors.

The conduct of members of the Service must be above criticism. Being in the public eye, they should try at all times to add honor to the uniform. The Navy will be judged by an officer's appearance and behavior. Most people will be proud to see him evincing a dignified determination to do credit to the uniform.

It should be remembered that all undertakings and projects must be carefully considered in advance and that all preparations necessary to the success thereof must be made well in advance. Officers hold their positions because they are believed to be capable of thinking ahead and making intelligent plans, and they must always strive to demonstrate that they are entitled to the rank they hold.

One of the best things that can be said about a junior officer by senior officers is that when he is given a job he can always be depended upon to get action and satisfactory results.

An officer cannot learn too soon that every officer has two personalities, the official and the unofficial. An officer who plays the "good fellow" on watch is sooner or later bound to come to grief. Holding a boat for a brother officer who is late is an example. It is a poor excuse to offer an executive officer that his written order contained in the boat schedule has been disobeyed simply because another officer requested it.

Whenever an officer receives an order requiring transmittal to subordinates for action, it is his duty to see that the order is *promptly* and *smartly executed.* His responsibility in the matter does not end until the order has been carried through to its proper completion.

PERFECTION THROUGH COOPERATION
The junior officer's careful handling of all assignments can help to insure a 4.0 in captain's inspection.

Sometimes an officer may not approve of certain orders that come down from above. Nevertheless, he must follow these orders implicitly and see that they are obeyed by his men. The promulgating of such orders may seem difficult. However, an officer should never apologize for them. He should never question an order in front of his men.

When a young officer reports on board ship, it is important that he devote most of his spare time to professional reading and getting acquainted with his ship's organization and regulations. It is well that a certain amount of time each day be set aside for professional study.

It is a wise procedure for an officer never to request permission to leave ship in the afternoon until the work assigned or expected of him has been completed. There is much to be learned in the first few months aboard ship. It is well to avoid being known as a "beach hound."

A junior officer of a division should always be in his part of the ship in the morning *before* his division officer arrives. He should also make it a point to be at general drills before his division officer. He should invariably address him as Mister ——.

A junior division officer should keep a complete notebook of his division, showing names, initials, rate, bunk and billet numbers, with all watch, quarter and station assignments. The book should be small enough to be carried on his person. It is also a good idea to keep in the security of one's room confidential records concerning various men. This information will be of service when giving quarterly marks and recommending men for advancement in rating.

The new officer will be kindly but critically evaluated by officers and men as soon as he comes aboard his ship. Senior officers do not always call attention to minor faults or errors made by juniors, but they are sure to notice them and will form their opinions accordingly. While they will make due allowance for lack of experience, their final estimate will be based entirely on what the young officer contributes. He should be ever alert and analyze his conduct frequently to determine if by chance he is offending unintentionally. A lack of deference toward older officers or a tendency to become familiar with them, or harsh unreasonable handling of enlisted men, or irresponsibility and lack of initiative will in each case produce unfavorable comment and an impression that will take some time to remove.

Some officers are prone to think that their badge of office will carry them through all difficult situations even though they are not fully qualified for the responsibilities of their office. They will find this to be absolutely untrue.

An officer should be particular about his appearance. He should wear his good clothes at quarters and his best clothes at inspection.

An outstanding naval officer of the 19th century, Matthew Fontaine Maury, said: "Make it a rule never to offend, nor to seek causes of offense in the conduct of others. Be polite to all, familiar with but few. The rule in the Navy is to treat everybody as a gentleman until he proves himself to be otherwise. It is a good rule—observe it well."

In general, members of the junior officers' mess address each other by their last names in unofficial conversation. However, when a junior officer is a member of the wardroom mess, he addresses seniors of the rank of lieutenant commander and below as "Mister," and those above that rank by title of their rank, i.e., "Commander," "Captain," etc. The commanding officer is, of course, always addressed as "Captain." The senior officer of the wardroom mess will always welcome a junior officer and treat him as a full-fledged member of the mess in every respect. Nevertheless, a junior officer should not be too forward in conversation or action. An error on the side of formality is more readily pardoned than one in the other direction.

It has long been the custom in the Navy for officers to be prepared and to relieve the watch not later than 10 minutes before the bell. This requires being on the bridge at sea 15 or 20 minutes before the bell. Late relieving is not only a breach of naval custom but is discourteous and unpardonable.

Disinclination to assume responsibility is an indication of lack of moral courage. The willing acceptance of responsibility strengthens a man's character.

It is well to remember that there are no limiting working hours for officers.

General Shank says: "Of all the valuable qualities an officer can have, few of them are superior in importance to tact. In a military sense it means a knowledge and an appreciation of *when* and *how* to do things. Tactful officers know how to deal with their shipmates—both senior and junior. The usefulness of many an otherwise capable officer has been marred because of the lack of tact. The importance of tact in an officer's career cannot be overemphasized."

In conclusion, all organizations in society have certain customs and etiquette. These are especially necessary for smooth cooperation between men living close together as is done on board a man-of-war. Disregard of customs and etiquette marks an officer as careless, lazy, or ignorant. Some ships, especially smaller ships, may not follow these customs as strictly as the larger ones, but strict compliance with what has been said is the only safeguard until one has become thoroughly familiar with any slight variations allowed on board.

Finally, it should be emphasized that every officer and man takes a pride in naval traditions and eagerly conforms to the customs and etiquette of the Service. These traditions and customs stem from ancient times and are the honorable heritage of men who "go down to the sea in ships."

Now these are laws of the Navy
  Unwritten and varied they be;
And he that is wise will observe them,
  Going down in his ship to the sea.
As the wave rises clear to the hawse pipe,
  Washes aft, and is lost in the wake,
So shall ye drop astern, all unheeded,
  Such times as the law ye forsake.

Now these are the laws of the Navy,
  And many and mighty are they.
But the hull and deck and the keel
  And the truck of the law is—OBEY.

—*Captain Ronald Hopwood, R.N.*

SPECIFIC PROBLEMS IN NAVAL COURTESY

The following are a few questions on naval courtesy and customs which will serve as a review of the material presented on this subject in Chapters 3 and 4.

1. If addressed by an officer, does an enlisted man salute: (a) at the beginning of the conversation? (b) at the end? (c) at both beginning and end of conversation?
   (If he is in formation, he does not salute, but just comes to attention. If not in formation, he salutes at beginning and end of conversation.)
2. When does a member of the guard *not* salute an officer?
   (When engaged in the performance of a duty which prevents saluting.)
3. A lieutenant is walking with a commander. They meet a lieutenant commander. Who salutes first? Why?
   (Lieutenant commander. The lieutenant cannot salute first, as he must wait upon the pleasure of his senior officer. Therefore, the lieutenant commander, upon approaching, renders the salute to the commander. The commander returns the salute, and the lieutenant also salutes at the same time.)
4. Is "Eyes right" a salute?
   (Yes, for men in ranks passing in review.)
5. When two naval officers meet on the street, both of the same rank but not knowing their comparative seniority, which salutes first?
   (They salute mutually, but in any case there should be no hesitation on the part of either, or delay in rendering the salute.)
6. When is the salute rendered not at 6 paces but when abreast?
   (When overtaking a senior.)
7. What do officers salute besides naval personnel? (Note: not "whom," but "what.")
   (The national anthem, the national ensign, and the quarterdeck.)
8. When officers of varying rank are walking in company and are tendered a salute, do the junior officers wait for the senior to acknowledge the salute, or do they acknowledge it immediately?
   (They wait upon the senior, and salute with him.)
9. Are Reserve officers not on active duty (and not in uniform) entitled to a salute?
   (No.)
10. Is it proper to salute an officer in the Public Health Service?
    (Yes.)
11. Does one salute officers in the Maritime Service?
    (Officially no, but yes by courtesy under proper circumstances.)
12. What kinds of salute or salutes can you name?
    (Some are: Hand; rifle (at order arms); rifle (at right shoulder arms); rifle (at present arms); "eyes right.")
13. Their right hands occupied, an Army officer and a Navy officer meet. May they salute each other with the left hand?
    (The Navy officer may, the Army officer may not.)
14. An officer, covered, and walking down a passageway of a Navy building encounters a senior officer who is uncovered. Should he salute?
    (Yes. However, the uncovered officer cannot return it except by a nod or greeting.)
15. The same officer, still covered, reports in the building to a senior officer. Should he salute?
    (No. He should uncover before reporting.)
16. If a naval officer of the line meets a staff officer of the same rank, who salutes first?
    (If the line officer has an earlier or the same date of rank, then the staff officer salutes first. However, if the staff officer has a prior date of rank, the line officer salutes first.)
17. When an officer awards an enlisted man a decoration or citation, should the officer salute first?
    (Even though no specific regulation exists, the practice is that an enlisted man after receiving an award steps back and salutes the officer who returns the salute.)
18. If an enlisted man is walking with an officer and another enlisted man approaches and sa-

lutes, does the enlisted man walking with the officer also salute?
(No. *Navy Regulations* authorizes salutes only between officers and officers, and between officers and enlisted personnel.)

19. If a woman officer is in church and the national anthem is played, does she salute? May she sing with the congregation?

(In such instances it is presumed that the hat is not being worn as a badge of office, but is in conformance to civilian rather than military custom. She should not salute, but stand at attention. It is permissible to join in the singing).

20. Should one sit in the stern sheets of a boat if a senior officer is present?

(No, unless invited to do so.)

21. If one is passing a radio store and hears the strains of the national anthem being broadcast, should one stop on the sidewalk and salute? (No.)

22. If one steps into a hotel elevator in which women are present, should one remove the cap? (Good judgment and circumstances should determine the answer. In crowded elevators, it is customary not to remove the cap. However, if others do so, one may follow suit rather than seem to be withholding a courtesy.)

23. When introduced to a senior, should one make the gesture to shake hands?

(No. The gesture may, however, properly come from the senior.)

24. Is it proper to address a lieutenant commander as "Commander"?

(Actually no, although lieutenant commanders who are executive officers of ships are frequently so addressed.)

25. On what occasions should an officer who is attending a military funeral (officially) salute? (He salutes whenever honors are rendered. Honors are rendered when the body is moved from (a) the hearse to chapel, (b) chapel to caisson, (c) caisson to grave; also during the firing of volleys and sounding of "Taps.")

CHAPTER 5

DISCIPLINE

THE IMPORTANCE OF DISCIPLINE

Meaning of Discipline

To the average person the word "discipline" carries with its connotations of severity, an unreasonable curtailment of freedom, unnecessary restraints on personal conduct, endless restrictions, and compliance with arbitrary or unreasonable demands of authority. Actually, discipline is the basis of true democracy; for without depriving an individual of his fundamental rights, it nevertheless requires adherence to a set of rules which man, through the experience of the ages, has found best suited to govern relations among members of society. Some of these rules are made by duly constituted authority and are laid down in writing. These are called *laws.* Others have been sanctioned by custom and usage, and are called *conventions.* Everyone is subject to some sort of discipline.

Discipline is therefore not peculiar to military organizations. It is present to a greater or less extent in any civilized society. No business, certainly no manufacturing activity, could operate without it. We are subjected every day to the discipline of police regulations, sanitary rules, even to the inexorable laws of nature. The desirable and happy citizen is one who has a healthy and proper concept of discipline.

Discipline implies subjection to a control exerted for the good of the whole, the adherence to rules or policies intended for the orderly coordination of effort. Obviously, discipline is indispensable to a military organization, for without it an organization otherwise military becomes merely a mob. Hence, one of the primary responsibilities of a leader is the inculcation of discipline.

The purpose of discipline is to bring about uniformity in cooperating for the attainment of a common goal. This uniformity can be obtained when a person understands how to fashion his interests to fit into the organization as a whole. Discipline rightly viewed is a character builder rather than a destroyer of individuality. Consequently, discipline develops teamwork among a crew and causes each man to

DISCIPLINE IN ACTION
The purpose of discipline is to bring about uniformity in cooperating for the attainment of a common goal.

pull his weight in the boat under all conditions of storm or action, despite congested living conditions and the complex nature of modern marine equipment.

An efficient military organization comprises a body of human beings trained and disciplined to concerted action; understanding one another through the sharing of common knowledge; and bound together by a unity of will and interest which is expressed by their willingness to follow and be obedient to their leader. A group so organized is effective not only for the specific purpose intended, but for almost any emergency. Thus, a turret crew may readily be converted into a repair gang for carrying out an essential job within its capabilities; a company of midshipmen may readily be turned into a fire-fighting organization.

Actually, discipline is difficult to define. However, its fruits are manifested in a smart salute, in proper wearing of the uniform, in prompt and correct action in an emergency, or in the battle efficiency that brings victory in wars. Readiness is an earmark of the disciplined man or organization.

A Taut Ship Is Effective

A well-disciplined naval unit responds automatically to an emergency and is not subject to panic. An incident in World War I illustrates this point.

Two sister ships lay in adjoining anchorages. One was known as a taut ship. Her executive officer recognized the value of proper organization, discipline, and training. The first few months of his administration had been difficult to be sure, but gradually the ship fell into line, the crew functioned as a unit, and it became easier to do things the right way.

Her sister ship lying nearby was an example of the opposite. Her decks were dirty, her crew was slovenly and careless in salutes, her records were cluttered with courts-martial.

It was nearly midnight and the tide was running out strongly against the wind, making a nasty chop. A motor launch from the slack ship was bucking the sea, her liberty party huddled up in the stern under a tarpaulin. The coxswain had ordered the men to distribute their weight farther forward so that he could see better over the bow of his boat, but their concept of obedience was in keeping with their ship. In the blackness the launch struck a channel buoy, capsized, and sank almost immediately.

DISCIPLINE DEVELOPS TEAMWORK
The crew that has been trained to pull together in normal working situations will automatically do so when an emergency arises.

On the first ship, shrill cries were heard coming from the dark waters. All her boats were hoisted, and her entire crew except the anchor watch had turned in. But at the first cry for help, the words, "Man overboard!" rang through the ship. The ship's organization had provided that a man be on the lookout—and he was. Men and officers came promptly from their quarters in pajamas, underwear, or any clothing within reach. Three boats reached the water almost simultaneously, and by the time they were away, the searchlights had been manned and were playing over the water. Before the tide could sweep the victims away, sixteen men from the liberty boat had been saved.

Meanwhile, what was happening on the second ship? No one knows exactly. Perhaps the officer of the deck was engaged in some duty on the far side of the deck; perhaps he had stepped below for a moment. Whatever the facts, the second ship did nothing until the lifeboat from the first ship hailed it in passing in its search for survivors. Whereupon the officer of the deck innocently inquired about the excitement. The reply of the lifeboat coxswain (who happened to be the executive officer of the first ship) unfortunately has not been preserved in the records. Sixteen men owed their lives not to their shipmates but to the hard-earned discipline of the crew of their sister ship.

So far as the Navy is concerned, the desired goal is that quality of discipline which is based on respect for leaders, confidence in justice and fairness, and the compulsion of moral force. Discipline based on force alone cannot endure. *Lasting discipline must be induced.* True discipline is the inculcation of loyalty and intelligent initiative. Blind and unthinking obedience, mechanical response to specific commands, has no place in the military organization of today.

Punishment is not personal; it is not vindictive; it is not inflicted as revenge for misconduct; nor can it serve to right the wrong that has resulted from an act of dereliction. A young officer should remember that when a senior finds it necessary to reprimand him, the senior is acting in his official capacity and discharging his duties. The opinion which the senior entertains of the junior need not necessarily have been altered and there need be no change in their personal or unofficial relations.

Ways of Securing Discipline

Various ways are suggested for securing discipline. That method which is based upon fear of the consequences of its violation—the discipline of fear—should be less and less necessary. There is what we like to consider as the American ideal of discipline—a cheerful and spontaneous one to which men willingly and gladly subject themselves out of faith in the cause for which they are striving and out of respect for and confidence in their leaders.

Men are controlled largely by one of two motives: fear of punishment and hope of reward. Hope of reward is the more desirable stimulus for it results in greater efficiency and harmony. Nevertheless, fear of punishment has its place in obtaining immediate results in certain cases. The Navy has no place for the habitual offender. Punishment, like dynamite, is strong and dangerous, valuable and destructive, astonishingly effective when used rightly and alarmingly destructive when used wrongly.

Before taking any kind of disciplinary action, it is wise to make sure of all the facts. Situations should be evaluated. For example, it is best to avoid contact with a drunken man and, above all, not to argue with him, since obviously at such time his judgment and common sense do not function too well. The master-at-arms should take him into custody until he is sober.

When an officer trips a bluejacket in something, it should be an impersonal matter. In fact a twinkle of amusement in the eye will do no harm (unless the offense is a serious one involving the mast or a possible court). To be unbending in the application of punishment or the reproof of misconduct is essential and important. It is fatal to let subordinates get away with anything.

An officer cannot afford to lose his temper. It is not always easy for him to hold back his anger but he must make a conscious effort to do so. An officer who loses his temper loses control of the situation because he has lost control of himself. In administering punishment he should be calm, impersonal, and dignified. If, however, he is extremely incensed at some deed of an enlisted man, precipitous action is unwise. After pacing the deck for a few minutes, he will be better able to handle the situation constructively. The offender, too, should be given the opportunity to "cool off." The calmer an officer is in his usual performance of duty the more action he can get when the occasion demands. The officer who is constantly shouting creates a certain amount of confusion and soon ceases to be effective; eventually he gets little or no response from his subordinates.

Sarcasm, too, is a tool to be avoided. A subordinate resents it since it is a weapon that takes unfair advantage of his relation to his superior.

Praise and Blame at the Right Times

At this point it may be well to consider carefully the words of John Paul Jones: "No meritorious act of a subordinate should escape attention or be left to pass without its reward, even if the reward be only one word of approval. An officer should be universal and impartial in his rewards and approval of merit, so should he be judicial and unbending in his punishment or reproof of misconduct." It is to be noted that Jones stresses appreciation first, and if that fails, disciplinary action. The officer who is unfamiliar with the meaning and use of commendation is laboring under a tremendous disadvantage. A word of friendly counsel to the new men, a little encouragement to the easily discouraged, a look of approval to a smart turnout at quarters, a smile of satisfaction to the turret crew after an exceptionally good performance at drill, a willing ear to the fellow with a suggestion—little acts of this kind will do more to keep men behind the officers and abreast of them, than blind threats, the mast, brig, or a court-martial. *Commend publicly—reprove privately.*

If the boatswain's mate or coxswain has been working at some job in charge of a party of men and has handled the task quietly and efficiently, he might be commended in this way, "Very well, Brown, that was nicely done." The next time he has a job on hand he will take pride in equaling or surpassing the standard which he has established. It is poor judgment to administer praise too liberally, for men dislike an excess of it. They will regard the officer as insincere, or feel that he is trying to make himself popular.

On the other hand, what should be done about Coxswain Bill Smith whose motorboat has continuously fallen below the required standard of cleanliness? Here, the primary mission and objective are not the motorboat, but Smith himself.

Heckling and driving may help, but if it is possible to get Smith to take pride and an intelligent interest in his boat, then a great deal has been accomplished. Not only is the boat clean, but Smith has become an asset rather than a likely disciplinary case.

The naval officer bears much the same relation to Smith that Smith bears to the boat. Therefore, the officer must first discipline himself; find the proper relationship to his men; and all the Bill Smiths and their boats will, in due course, fall into line.

Remember, it is Smith who needs changing. So, encourage him or reprimand him; teach him or discipline him; handle him in whatever constructive way heaven gives you the wisdom to do, but do not leave him to muddle along indefinitely.

Continuity of Discipline

It is a naval axiom that a "taut ship is a happy ship" because the crew knows what to expect. A breach of discipline cannot be smiled away one day and rebuked the next. Discipline can be strict without being stiff and formal. For the first offense, light punishment may prove more effective than a stiff court sentence if it is prompt, certain, and just.

Laxity in performance of duty, or insubordination, must be routed as soon as it appears. Any hint of trouble must be promptly forestalled. A "Dutch Uncle" talk or a private reprimand at the start may save a mast or a court later. Equally desirable is an attitude of public commendation for outstanding work accomplished, but praise must not be expected for doing the required duty.

Another aid in securing discipline lies in the method of presenting "Rocks and Shoals." This is a familiar term for the Articles for the Government of the Navy which are the fundamental basis of authority and discipline. They are posted on the bulkheads of all ships and stations in the form of a large chart, and are also found in *Navy Regulations.* Officers are urged to study the Articles and review them frequently. Worth-while dividends will accrue in the form of a higher standard of discipline if they are read carefully (not inaudibly mumbled) and explained at quarters.

It is the duty of every division officer to explain to his men the gravity of desertion and the stigma of disgrace that attaches itself to a deserter all the days of his life. A man who is more than twenty-four hours late in returning to his ship or station is listed as a "straggler," and there are severe penalties awaiting him unless a satisfactory explanation can be made to the commanding officer. The status of a straggler changes to that of a deserter at the expiration of thirty days' unauthorized absence—or less, if the intent to desert is manifest. For example, if an enlisted man went ashore without permission, taking all his personal belongings with him and announcing to his shipmates that he was leaving the service for good, he should immediately be declared a deserter. Conviction of desertion in time of war makes discharge mandatory, as a man convicted of this offense can never again hold a position of trust or profit in the United States Government service. After conviction of desertion in time of war, a man cannot be restored to duty or ever again reenlisted.

It is well to tell the men something of the history of the Articles and their importance; to point out the fact that they represent the accumulated knowledge

READINESS IS AN EARMARK OF THE DISCIPLINED MAN OR ORGANIZATION
The fruits of discipline are manifested in prompt and correct action in any situation, and especially in the battle efficiency that brings victory in war.

of generations of naval officers and represent the basic lessons of experience. They can be made both interesting and instructive.

Officer Responsibility for Discipline

It is the duty of an officer to study his men, watch them, learn their language and point of view, work with them, guide them, find out all their tricks and try to discover those leading in mischief. The officer reports whom he must and commends whom he can, but whatever he does, he must never lose faith, for when that happens it is not they who are hopeless but he who is beaten. Teaching even one seemingly hopeless specimen to hold up his head and take pride in himself and in his work is one of the finest things an officer can do.

Nothing tends to destroy good discipline more than the attitude of an officer who by word and deed says to his subordinates, "Don't do as I do. Do as I say." This is the false discipline of bad example from above. To promote good discipline the officer must set high standards by example and precept and insist that these standards be maintained. Our enlisted men are too intelligent and too high-spirited to extend respect and loyalty to superiors who allow hypocrisy and insincerity to govern their actions. The officer must *practice what he preaches.*

When an officer is seeking the truth concerning an alleged offense he should question first the man making the report and afterwards the defendant. He should give no credence to the story of either until all facts are clear. Before a case is brought to the mast, the names of all witnesses should be obtained and investigation of all details should be completed. If the inquiring officer is convinced that there is a definite case against the alleged wrongdoer or if he feels that further investigation under the more mature judgment of the commanding officer is needed, then and only then should the culprit be reported. Indiscriminately bringing men to the mast for trivial offenses is unwise. On the other hand, the "good Joe," or the officer who under no condition reports a man is a menace to discipline and a nuisance to his fellow officers.

If an officer hopes to deserve loyalty and obedience from those under him, he must earn them by giving like qualities upward. If by action or word he is disloyal to his superiors, the men will doubt his loyalty to them, and their loyalty to him will suffer correspondingly. It is essential for the officer to let his men know that he respects and honors the policies and motives of their common senior. Just as zealously, he renders loyalty to his men and looks out for them. He takes an interest in them; knows them by name; is zealous about their rights and privileges. Under such conditions, offenses requiring disciplinary action become less and less frequent.

The commanding officer at captain's mast can assist most men to a better presentation of their cases when he asks, "What seems to be the matter?" or "How did this happen?" and similarly phrased questions indicating a desire to hear all that the man may have to say in his own behalf. The usual stereotyped, "Well, what have you got to say?" is likely to invite a hopeless, defensive, or even resentful attitude which is not helpful to the main issue—the administration of justice.

Under no circumstances should the commanding officer do or say anything at mast which would tend to tear down a man's pride or confidence in himself. It is to be remembered that it is the *act* of misconduct which receives condemnation, rather than the individual who committed it. The accused person should leave the mast not with a feeling of defeat but with a determination that he can and will do better in the future.

Certain mast cases, and punishment inflicted there, may be a reflection on the methods of the officer who trained and indoctrinated his subordinates. The best discipline comes from positive, energetic, and just leadership. As Admiral Jervis said, "Discipline begins in the wardroom."

Mastless discipline is not a one-man show, nor is it dependent on officers alone. Every petty officer is

COMMANDING OFFICER ADDRESSING CREW MEMBERS

A short informal talk by the commanding officer is a good means of establishing understanding between him and his ship's company. The smaller the group addressed, the better the results.

necessarily a technical expert in some line and his rating badge signifies that he is a leader of men. He is an important part of the ship's disciplinary organization. Therefore, he should be invested with authority, and it is the part of wisdom to work through him, support him, and hold him responsible for the results. Nothing creates greater confusion than for an officer to give orders over a petty officer's head without advising him that he has been relieved from direct supervision of the particular task. The petty officer should never be reproved in public; to do so undermines his authority as well as his morale. If he is at fault, a private talk will clear the matter and prevent indiscreet judgment on the case.

Every day it is becoming more apparent that as ships and crews grow in size, petty officers must be increasingly relied upon. For example, if an enlisted man makes a mistake in the presence of both an officer and a petty officer, it is the duty of the latter to instruct the man. Moreover, unless this duty becomes habitual on the part of the petty officer, he should be reprimanded. A petty officer who stands and complacently watches a man commit a breach of discipline, without endeavoring to correct him immediately, commits a far worse offense than the man he watches. Any petty officer who is not alert and actively assertive for the good of the ship should not be tolerated even for an instant—there are many men eager to take his place.

Just and Unjust Punishments

Navy punishment must be just, and to accomplish its purpose must be so recognized by the offender as well as by his shipmates. It should not be of such nature as to lower the man's self-respect nor so severe as to be out of proportion to the gravity of the offense. Most certainly, personal likes and dislikes should never motivate a reprimand or function in the matter of awarding punishments. No matter how exacting a leader may be, if he is fair and just his subordinates will not only live up to his exactions but respect and admire his attitude. To find fault with a man doing his best is only to discourage him. It is useless to punish a man for incompetence if he has done his best.

The keynote of Navy discipline is expressed in Article 1211 of *Navy Regulations*: "All persons in the naval service are required to obey readily and strictly, and to execute promptly, the lawful orders of their superiors." The rules of conformance with this regulation can be enumerated concisely as follows:

Obey orders promptly, cheerfully, willingly, and completely.

Obey the last order received from any responsible authority.

Show respect to your seniors at all times.

Make obedience a habit.

Military offenses as contradistinguished from conventional misdemeanors and crimes may be divided into two classes: those involving neglect of duty; and those involving deliberate violation of instructions, orders, or regulations. Offenses classified as neglect of duty, great or small, may result in punishment extending from loss of liberty to a general court-martial.

Offenses under the head of deliberate violation of instructions, orders, or regulations are usually tried by court-martial. Such offenses as a rule lie not so much in the consequences of the act as in the defiance of authority. It goes without saying that offenses involving moral turpitude or felonious intent, such as theft, forgery, rape, and murder, will result unquestionably in punishment by naval court-martial.

Principles of Good Discipline

In conclusion, let us summarize the principles of good discipline:

"A taut ship is a happy ship" because the crew knows what to expect.

It is a well-established fact that those ships are the happiest and most efficient wherein the discipline is firm and infractions are punished promptly, evenly, and adequately.

It is not the severity of punishment that restrains men but the certainty of it.

A "Dutch Uncle" talk or a private reprimand may save a mast or a court sentence later.

Nothing gives a better indication of the state of discipline than the observance of the forms of military courtesy.

Do not let trouble get headway if you can avoid it.

Punishment is not personal or vindictive; it is not an instrument of revenge nor a means of righting a wrong. It does, however, furnish an object lesson to the wrongdoer and to others not to repeat the offense.

If you hope to secure loyalty and obedience from your men, you must earn it by giving loyalty and obedience upward. Be loyal to your men, take an interest in them and make sure they enjoy their rights and privileges. Remember, you may drive men to obedience, but you cannot drive them to loyalty.

Don't talk or argue with a drunken man. Turn him over to the master-at-arms for safekeeping until sober.

Commend publicly—reprove privately.

Gain the confidence of your men and be worthy of it.

Don't lose your temper. Avoid using sarcasm and ridicule in dealing with your men.

Be unbending in the reproof of misconduct—don't allow men to get away with anything.

Use "Rocks and Shoals" as a tool for better discipline.

In maintaining discipline, give your petty officers authority, work through them, support them, and hold them responsible for results.

Good example on the part of officers is a prime requisite both in the building up of discipline and in its maintenance. Officers must practice what they preach.

A ship's company may be said to have been brought to an ideal state of discipline when there exists in it a maximum of efficiency and contentment combined with a minimum of punishment.

In concluding these suggestions on methods of obtaining good discipline in the Navy, it might be well to quote at length from the letter of 26 August 1947 promulgated by Admiral T. C. Kinkaid, Commander Atlantic Reserve Fleet. This letter clearly sets forth a number of suggestions that will enable the young officer to conduct himself properly and to deal successfully with disciplinary problems among his subordinates.

> A high standard of smartness was a special source of pride to all naval personnel in the years before the war. Orderliness and smartness had become a habit and a way of life and their existence paid tremendous dividends when the Navy was faced with the demoralizing influences of war. With the cessation of hostilities it is again possible and imperative to return to the highest possible standards in order to rebuild the initial moral strength which is an essential part of the foundation upon which to expand the naval establishment in time of war or emergency. A prerequisite to successful administration is that it be conducted with justice and with firmness. The timeworn expression that "a taut ship is a happy ship" is true and always will be true, the atomic age and jet propulsion notwithstanding.
>
> The subject of duty and its performance is too vast to be discussed fully in this letter. The word "duty" implies a moral obligation to other people, to a principle, or to an established order. A sense of duty implies acceptance of this obligation as the guiding motive in all our dealings with our fellow man. It implies also a willing subordination of self whenever this will further the task. A sense of duty depends for its very existence on the ability of the individual to be honest with himself and on his ability to recognize and disregard the promptings of selfish or morally dishonest motives. To do one's duty requires further that the individual, having honestly and humbly chosen what he considers the right course of action, possess the moral courage necessary to follow that course.
>
> Commander Atlantic Reserve Fleet desires to discuss briefly the following aspects of performance of duty:
>
> *The Attitude of the Officers*: Due to lack of experience, lack of indoctrination, and sometimes lack of genuine leadership and example from senior officers, some of our post-war officers may be blind to the fact that a commission not only clothes them with certain authority and places definite responsibilities on their shoulders, but

THE COMMANDING OFFICER'S RESPONSIBILITY
Although the commanding officer may delegate many of his responsibilities, he may occasionally prefer to exercise personal supervision.

imposes on each officer a moral obligation, the faithful and selfless discharge of which constitutes one of the prime requisites of effective military leadership. One important aspect of this moral obligation is the officer-enlisted man relationship and all that relationship involves. Thought, study, and earnest application are needed. Each officer is in a position of trust with respect to the enlisted men under his supervision. It is essential that the enlisted man feel that his officers are sincere, and that they are capable and willing to devote time and energy to see that the enlisted man receives thorough training and indoctrination and is given fair treatment in all matters, both personal and professional. The officer must make the enlisted man's future his own future; he must *believe* in the system himself. Any perfunctory and half-hearted action in this matter is worse than no action at all. The enlisted man must have confidence in the ability, sincerity, and integrity of his officers. It is repeated that each officer *must recognize his obligation and believe in it.* Failure to do so is a betrayal of his trust.

Personal Relations with Enlisted Men: The manner of dealing effectively with enlisted men varies with almost every individual officer, but it can be said categorically that officers cannot successfully "fraternize" with enlisted men, "knock off rates," or attempt to be "one of the boys." Officers cannot indulge in these practices and retain the unquestioning respect (and self-respect) so essential to a successful military organization. The officer attempting these things often makes himself look ridiculous and the resulting loss of prestige is extremely difficult to regain and usually requires a change of station before it can be regained at all. The odds against success are too great and, furthermore, such practices are not necessary. They are no more necessary in the Navy than they are in any other profession or business. The relationship desired is one evolving from mutual respect and a cooperative desire to discharge one's duties and obligations in a way that will best support the naval establishment and the policies of the United States Government. The naval service is just that—service. The ideal of service is easy to understand in time of war or national emergency. In the routine business of "keeping the guns clean" in peacetime, this ideal, so essential and fundamental that its absence makes *esprit de corps* most difficult, is apt to be relegated to a dark corner. Officers and enlisted men must acquire the feeling that it is a privilege to wear the naval uniform and their actions must reflect that feeling.

Conduct of Officers: Unless and until officers conduct themselves at all times as officers should, it is useless to demand and hopeless to expect any improvement in the enlisted ranks. Conduct means speech, dress, manner, attitude toward seniors and juniors and vested authority in general. An officer's basic military character is directly and faithfully reflected in all of these things, and he can expect success or failure as a leader in direct proportion to his efforts along these lines. It is not enough that an officer go through the motions. He must constantly strive to cultivate the correct attitude and to make it part and parcel of his everyday existence. If the military philosophy seems all wrong and the enlisted men are unmilitary, uninterested, and irresponsible, let each officer look to himself for the source of trouble, for it is the attitude and conduct of the officer group that make or break the entire democratic military system.

Commander Atlantic Reserve Fleet cannot express too strongly the urgent need for action from the top in the subject matter discussed in the foregoing paragraphs. Matters of correct attitude, personal conduct, and awareness of moral obligations do not lend themselves to control by a set of rules or to scientific analysis. They are the intangible attributes which are part of the cornerstone of success in life. They are a way of life and their acquisition and retention are lifetime tasks. Many methods of instruction and different approaches to the problem will present themselves. It is a difficult subject—one which requires constant effort on the part of the instructor. Each experienced naval officer must consider himself an instructor in this matter and the future tone of the naval service may well depend on the sincerity which he brings to this task.

HISTORY OF NAVAL LAW

Introduction

While many Americans and British may point with pride to the uniqueness of their traditions, actually the evidence shows that both have borrowed and adapted from the other. The British have a longer tradition, of course, for their country was old in 1492 when America was discovered. Their maritime history goes back to the Middle Ages and earlier. But Americans and British not only speak the same language, they also admire the same sort of hero, punish with the same sort of punishment and with about the same degrees of severity, and think alike both on the high seas and in port.

The Rules for the Regulation of the Navy of the United Colonies which were written by John Adams and adopted by the Continental Congress in 1775 had as their basis the Articles for the Government of the British Navy. In approving them, with certain modifications and additions, the Continental Congress was simply retaining and making authoritative the traditions and laws of naval service with which the seafaring population of the Colonies had long been familiar.

Because our system of naval law is so closely linked with that of the British, which in turn is linked with the system established by the Romans, the greatest legal administrators in history, a glance back at British maritime law is in order.

British Maritime Law

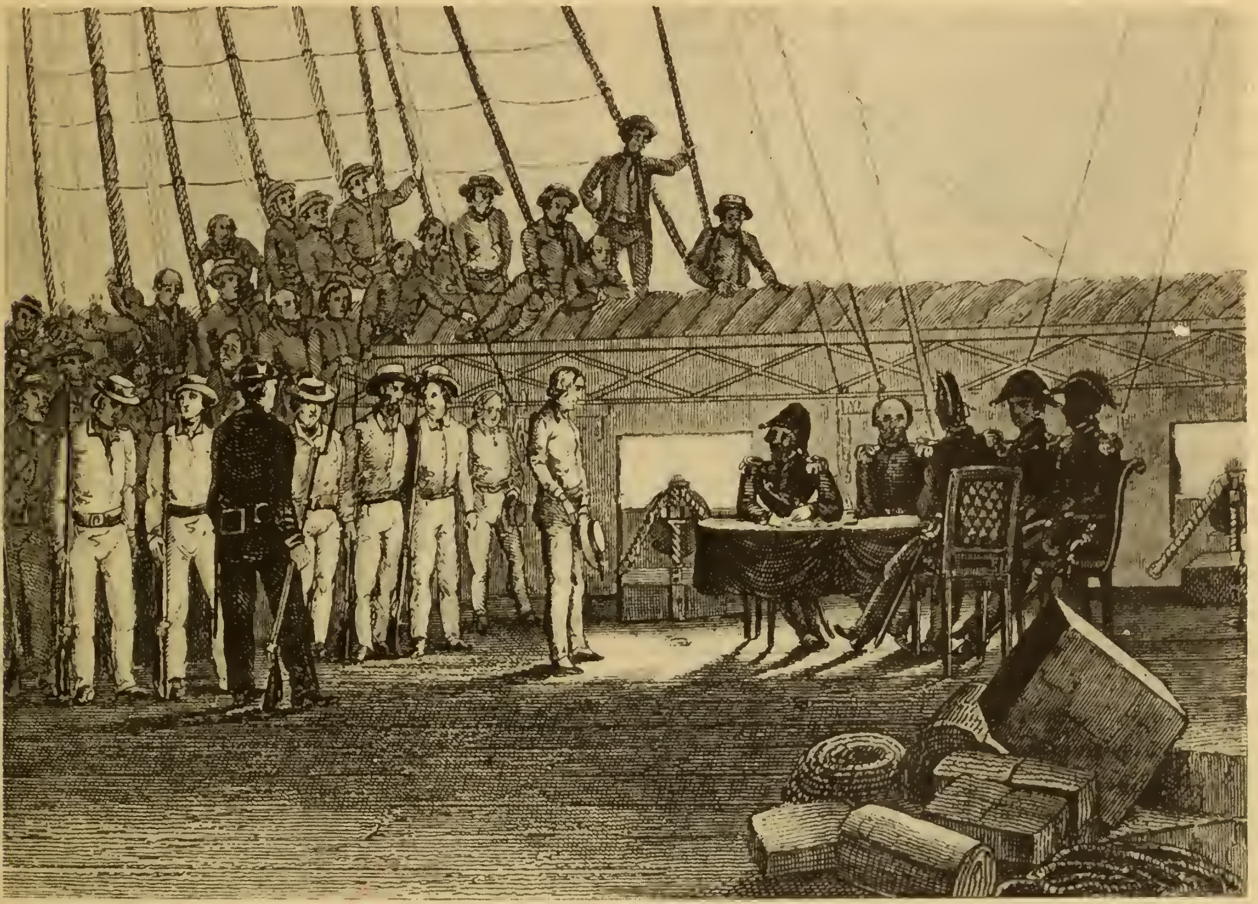
Although the Articles for the Government of the British Navy had been adopted by Parliament in 1749, they did not originate in that year. They had behind them a long history of development.

Due to the fact that Great Britain is an island, there never was a period when Britons did not on occasion put to sea with warlike purpose. But to the end of the Middle Ages there was no regularly constituted navy that had a continuous existence. The king was able to assemble quickly a sort of naval militia when an emergency arose. He usually had a few ships of his own, and in return for certain commercial privileges the ports along the Channel were under obligation to furnish him on demand a specified number of vessels for war use. In addition to these, the king could draft or impress into his service any ships—even those of foreign nations—that happened to be in any port of the realm.

Apparently the early kings had no concept of the value of a navy as a military instrument, or of the importance of its continuous maintenance and readiness for use. Fleets were improvised as occasion demanded, to transport troops, to keep open communications, or to meet enemy fleets already at sea; but the real work of defense or conquest was the duty of the men at arms. The disbanding of a fleet followed promptly on its return from a successful exploit. For this reason no special laws were required for the government or control of the officers and men who sailed these temporary warships. They were governed by the general maritime law of the time and by the ancient customs and usage of the sea.

In the 12th century, a code of maritime law was drawn up. It was known as the Code of Oleron, taking its title from the name of a large island off the west coast of France that was an important shipping center of the time. This code was long held to be authoritative in defining and regulating the rights and duties of shipowners, masters, and seamen; and the maritime power of England was governed for many years by its general tenets. The Code of Oleron, to trace back still further, had as its basis the sea law of the Republic of Rhodes, derived from Roman law long before. Thus we see that the earliest foundation of naval law of today actually dates back to the maritime laws of ancient times.

The very first rules made by an English king to apply specifically to discipline on naval ships were issued by Richard, Coeur de Lion, in 1190 when he was passing through France on his way to join his fleet at Marseilles prior to setting sail for the Holy Land. The most important rules number only six, and very likely merely gave definite expression to



COURT-MARTIAL IN SAILING DAYS
The court-martial has been in existence as a military tribunal for hundreds of years. Its aim has always been prompt, efficient administration of military law.

customs already well established. They are sufficiently curious and interesting to be set forth as illustrating the punishments of that day. The barbarity of the penalties is in keeping with the contemporaneous methods of executing justice. In effect, they were:

1. Anyone that should kill another on board ship should be tied to the dead body and thrown into the sea.

2. Anyone that should kill another on land should be tied to the dead body and buried with it in the earth.

3. Anyone lawfully convicted of drawing a knife or other weapon with intent to strike another, or of striking another so as to draw blood, should lose his hand.

4. Anyone striking another with the hand, no blood being shed, should be dipt thrice in the sea.

5. Anyone uttering opprobrious or contumelious words to the insulting or cursing of another should, on each occasion, pay one ounce of silver to the injured person.

6. Anyone lawfully convicted of theft should have his head shaved and boiling pitch poured upon it, and feathers or down should then be strewn upon it, for the distinguishing of the offender; and upon the first occasion he should be put on shore.

About the beginning of the 13th century King John appointed a Keeper of the King's Ships, the first definite sign of anything resembling naval administration. The *Black Book of the Admiralty* was compiled in the middle of the 14th century. This book defined with great detail the duties of an admiral. Among other responsibilities, he was assigned the duty of administering justice *according to the law and ancient custom of the sea*—a phrase that recurs constantly through the centuries. The first part of the *Black Book* dates from Edward III; the latter belongs to the reigns of Henry IV, Henry V, and Henry VI. It is considered to be the basis for British sea law and has been described as having developed order out of chaos.

In the 16th century came the beginning of the British Navy as a thoroughly established and continuous force. Continuity of policy and efficient administration were made possible by Henry VIII's creation in 1546 of the Navy Board which became a vigorous governmental instrumentality under Queen Elizabeth. During her reign the brilliant achievements of the British Navy in war and the distant voyages of bold navigators founded the school of successful seamanship of which was born the confident daring and self-reliance still prescriptive in the Royal Navy and merchant services. In all this time, however, no special code of law was adopted by the government for regulating and controlling the service of the British Navy. Ships still sailed under the ancient law and customs of the sea.

Some regulations did exist for the keeping of order afloat. These may have been formulated originally by individual commanders, and under Henry VIII these regulations were framed and entitled *Book of Orders for War*. It was instructed that these regulations should be "set in the mainmast in parchment to be read as occasion shall serve." In them we have the ancient rules of Richard and here too appears that fiendish penalty for a man guilty of sleeping for the fourth time on watch: that he be tied to the bowsprit, furnished with a biscuit, a can of beer, and a knife and then left to decide whether he preferred to die by starvation or by drowning (using the knife to cut himself loose from the bowsprit).

It was customary for admirals on assuming command to issue a series of regulations for the ships of their fleet. The time of origin of this custom is unknown but one of the earliest documents of this type in existence was promulgated in 1596. The custom prevailed until the early years of the 18th century. Admirals undoubtedly followed in the main the proclamations of their predecessors, but with the passage of time modifications necessarily were made to meet new conditions. Thus, gradually there came into existence a great body of these admirals' codes or articles, very similar, to be sure, in their main features but growing clearer and more precise with the passage of time. In them were to be found the essential principles of naval discipline.

Origin of Military Courts

The court-martial is the present-day version of the *curia-militaris*, or court of chivalry, also called the Marshal's court. This was originally the only military court that was established by the laws of England. Due to its weak jurisdiction, its lack of power to enjoin its judgments, and the fact that it was not a court of record, it fell into disuse. The constitution of military courts as we know them was adopted in the reign of Charles I. Their adoption was expedited by the mutiny of a number of English and Scotch dragoons that had been ordered to Holland for replacement of certain Dutch troops assigned to England.

The first regular naval tribunal was instituted by the leaders of the British Long Parliament in 1645. They passed a measure called An Ordinance and Article of Martial Law for the Government of the Navy. It was this act that for the first time authorized general and ships' courts-martial with written records; the former for captains and commanders, and the latter for subordinate officers and men. In a later law, the Lord High Admiral was given the power to issue commissions (precepts) to officers to hold courts-martial.

The First British Articles of War

It was not until Cromwell's time that Parliament passed a law for the general government of the British Navy. In 1649, it adopted rules for the government of the Earl of Warwick's fleet. Three years later these rules were somewhat recast and modified, and made to apply to the whole Navy. These, therefore, were the first British Articles of War (also referred to as the Cromwell Articles) specifically to be characterized as such, though they contained nothing that had not, in substance at least, already been enforced in the Navy under the authority of commanding officers. Here was a code of law, formally adopted by Parliament, to be of universal and continuing authority. It had the sanction not only of the commander in chief, but of the nation. This code, then, is the remotest *formal* ancestor of our American articles. The Articles number 39, and 13 of them prescribe the death penalty for specified offenses while 12 others make death an optional penalty.

The King's Regulations and Admiralty Instructions

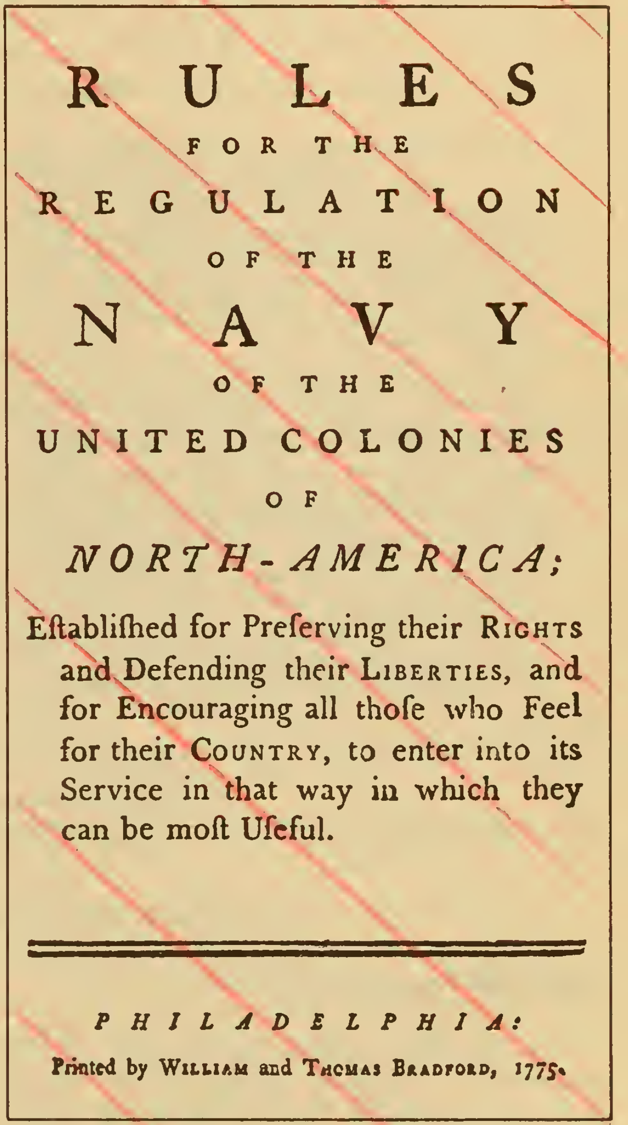
Even after the Cromwell Articles were adopted, commanders of fleets kept on issuing codes of instructions and rules covering details of service and discipline. Finally an effort was made to digest and codify these innumerable rules and to make a clear and comprehensive set of regulations conformable to accepted principles of naval usage. Thus in 1731 the first issue of the King's Regulations and Admiralty Instructions appeared. This code has been revised from time to time to conform with modern ideas and conditions but remains in substance much as it was when first issued. Naturally, it has had its influence on the development of similar regulations for the American Navy.

The New Articles of War

In 1749, just a hundred years after the adoption of Cromwell's first Articles, Parliament adopted new ones. These were the Articles from which John Adams drew in writing the Rules for the Regulation of the Navy of the United Colonies. But the groundwork of all subsequent modifications, which experience has shown to be necessary down to the present day, was laid by the first Articles adopted in Cromwell's time. Even much of their phraseology recurs in the British and American Articles of today.

Rules for the Regulation of the Navy of the United Colonies

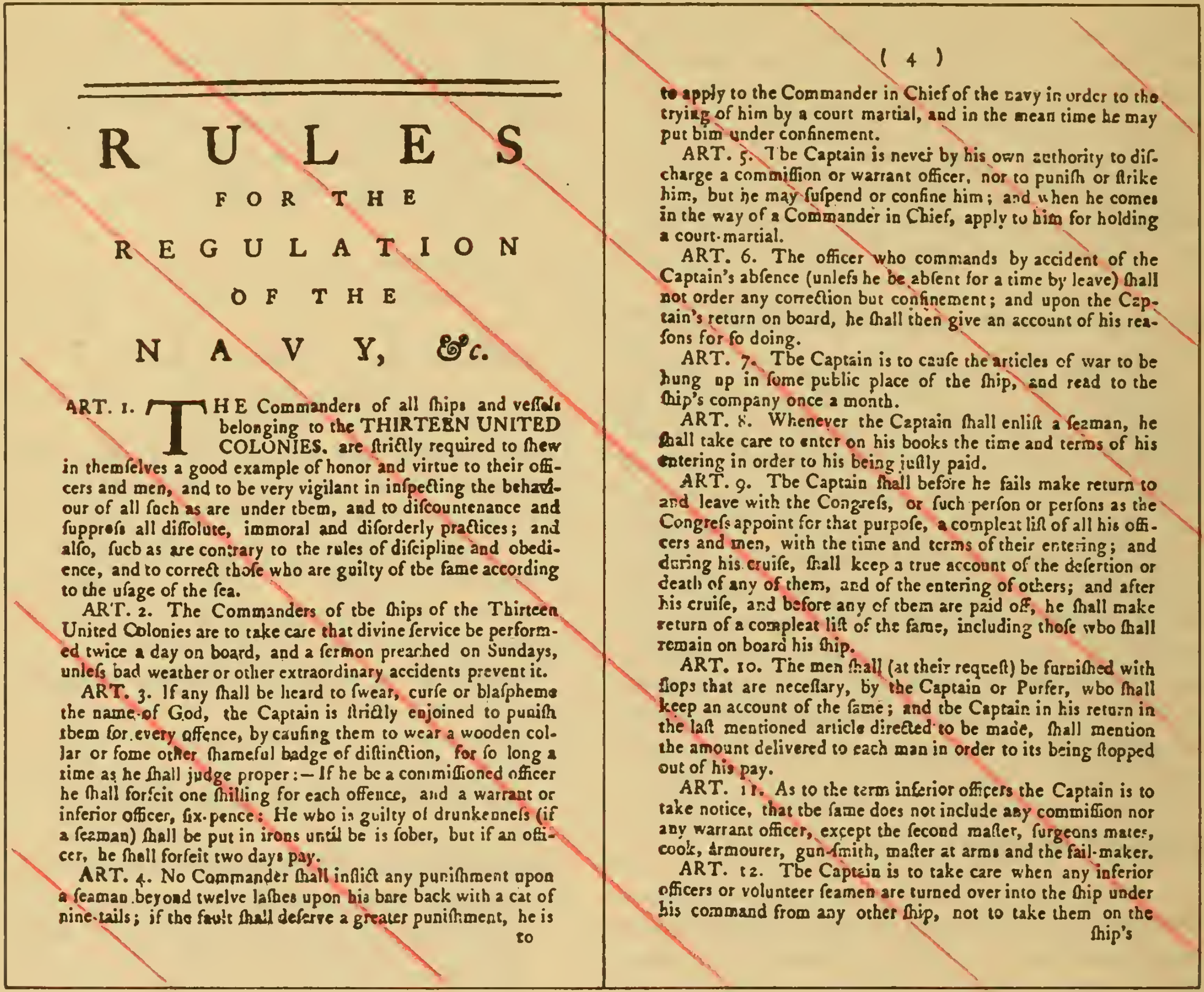
The first American Articles, titled Rules for the Regulation of the Navy of the United Colonies, were adopted in November 1775, more than seven months before the Declaration of Independence. They are discussed in the following chapter as the basis of the Articles for the Government of the Navy. Every commander of a naval vessel received copies and was required to post them in public places of the ship and cause them to be read to the ship's company once a month. They were incorporated into the Articles for the Government of the Navy which constitute the first 70 Articles of today's *Navy Regulations.*



RULES
FOR THE
REGULATION
OF THE
NAVY
OF THE
UNITED COLONIES
OF
NORTH-AMERICA;
Eſtabliſhed for Preſerving their Rights and Defending their Liberties, and for Encouraging all thoſe who Feel for their Country, to enter into its Service in that way in which they can be moſt Uſeful.

PHILADELPHIA:
Printed by William and Thomas Bradford, 1775.

"ESTABLISHED FOR PRESERVING THEIR RIGHTS . . ."
The original cover of the Rules of 1775 is reproduced above. Although the spelling is out of date, the purpose of the Rules is still applicable.



R U L E S
FOR THE
REGULATION
OF THE
NAVY, &c.

ART. 1. THE Commanders of all ſhips and veſſels belonging to the THIRTEEN UNITED COLONIES, are ſtrictly required to ſhew in themſelves a good example of honor and virtue to their officers and men, and to be very vigilant in inſpecting the behaviour of all ſuch as are under them, and to diſcountenance and ſuppreſs all diſſolute, immoral and diſorderly practices; and alſo, ſuch as are contrary to the rules of diſcipline and obedience, and to correct thoſe who are guilty of the ſame according to the uſage of the ſea.

ART. 2. The Commanders of the ſhips of the Thirteen United Colonies are to take care that divine ſervice be performed twice a day on board, and a ſermon preached on Sundays, unleſs bad weather or other extraordinary accidents prevent it.

ART. 3. If any ſhall be heard to ſwear, curſe or blaſpheme the name of God, the Captain is ſtrictly enjoined to puniſh them for every offence, by cauſing them to wear a wooden collar or ſome other ſhameful badge of diſtinction, for ſo long a time as he ſhall judge proper:—If he be a commiſſioned officer he ſhall forfeit one ſhilling for each offence, and a warrant or inferior officer, ſix-pence: He who is guilty of drunkenneſs (if a ſeaman) ſhall be put in irons until he is ſober, but if an officer, he ſhall forfeit two days pay.

ART. 4. No Commander ſhall inflict any puniſhment upon a ſeaman beyond twelve laſhes upon his bare back with a cat of nine-tails; if the fault ſhall deſerve a greater puniſhment, he is
to

(4)

to apply to the Commander in Chief of the navy in order to the trying of him by a court martial, and in the mean time he may put him under confinement.

ART. 5. The Captain is never by his own authority to diſcharge a commiſſion or warrant officer, nor to puniſh or ſtrike him, but he may ſuſpend or confine him; and when he comes in the way of a Commander in Chief, apply to him for holding a court-martial.

ART. 6. The officer who commands by accident of the Captain's abſence (unleſs he be abſent for a time by leave) ſhall not order any correction but confinement; and upon the Captain's return on board, he ſhall then give an account of his reaſons for ſo doing.

ART. 7. The Captain is to cauſe the articles of war to be hung up in ſome public place of the ſhip, and read to the ſhip's company once a month.

ART. 8. Whenever the Captain ſhall enliſt a ſeaman, he ſhall take care to enter on his books the time and terms of his entering in order to his being juſtly paid.

ART. 9. The Captain ſhall before he ſails make return to and leave with the Congreſs, or ſuch perſon or perſons as the Congreſs appoint for that purpoſe, a compleat liſt of all his officers and men, with the time and terms of their entering; and during his cruiſe, ſhall keep a true account of the deſertion or death of any of them, and of the entering of others; and after his cruiſe, and before any of them are paid off, he ſhall make return of a compleat liſt of the ſame, including thoſe who ſhall remain on board his ſhip.

ART. 10. The men ſhall (at their requeſt) be furniſhed with ſlops that are neceſſary, by the Captain or Purſer, who ſhall keep an account of the ſame; and the Captain in his return in the laſt mentioned article directed to be made, ſhall mention the amount delivered to each man in order to its being ſtopped out of his pay.

ART. 11. As to the term inferior officers the Captain is to take notice, that the ſame does not include any commiſſion nor any warrant officer, except the ſecond maſter, ſurgeons mates, cook, armourer, gun-ſmith, maſter at arms and the ſail-maker.

ART. 12. The Captain is to take care when any inferior officers or volunteer ſeamen are turned over into the ſhip under his command from any other ſhip, not to take them on the
ſhip's

". . . TWELVE LASHES UPON HIS BARE BACK . . ."
Article 4 of the original Rules, like article 24 of the present-day Articles for the Government of the Navy, limits the commanding officer in the punishments he may inflict.

SCOPE AND SOURCES OF NAVAL LAW

Purpose and Scope of Naval Courts

Naval law may be defined as the body of rules prescribed by competent authority for the government and regulation of the naval forces. Any system of discipline, however effective, would be inadequate if it were not backed up by the authority of a prescribed set of rules that exist for the purpose of enabling the naval tribunals to judge serious offenses. The practical application of this set of rules is manifest in the functioning of the naval courts. The composition is such that they can be summoned at comparatively short notice. The naval tribunals in order of their severity are: the captain's mast, deck court, summary court-martial, and general court-martial.

These four judiciary bodies are empowered to deal with offenses ranging from the simplest infractions, which are dealt with at captain's mast, to the most serious violations of naval law, which are adjudged by a general court-martial. The punishments that they are authorized to inflict range from a simple sentence of extra duties up to and including loss of life.

Men of the Navy are no different from men in any other walk of life, and the Navy's system of courts must be as broad in scope as any civil judicial system.

Civil Courts and Naval Personnel

The fact that a man is in the Naval Service does not free him from his obligation to observe the laws governing the civilian population. Naval personnel are subject also to civil courts when within their jurisdiction. Commanding officers afloat and ashore are authorized to permit the service of subpoena or other process upon the person named therein, provided such person is within the jurisdiction of the court out of which the process issues, but the commanding officer's permission must be obtained.

Where proper warrant is presented, the commanding officer is granted authority in continental United States, Alaska, Hawaii, and the Canal Zone to deliver enlisted men of the Navy and Marine Corps to civil authorities—Federal, State, Territorial, or local—without procuring authority from the Navy Department.

It is considered desirable to inform civil authorities that prompt and just action will be taken by the Navy. Whenever possible the Navy tries to take care of its own disciplinary cases.

If for any reason, a Navy man is held by civil authorities, for example, as an offender or as a material witness in court, he should take steps to have his commanding officer notified at once of the pertinent facts. If he is acquitted, his enforced absence will not be penalized when he is released. But if he is found guilty by the civil authorities he will not only be given the punishment awarded by them but will also receive a punishment for overstaying leave.

Officer's Need for Knowledge of Naval Law

The basic essentials of military law and the procedure in naval courts must be thoroughly familiar to the naval officer. An officer may be called upon at any time to fill various roles in the conduct of naval courts, as: recorder or judge advocate, when he performs as prosecuting attorney; member of a court-martial, when he combines the duties of judge and jury; or counsel for an enlisted man, when he acts as lawyer for the defense.

Naval courts are conducted with all the formality and gravity of similar courts in civil life. Each individual present is there for a definite purpose and has a great responsibility assigned him. Each one must play his part in such a way as to maintain the dignity of the court, and insure the swift, efficient administration of justice. There can be no hesitation, no doubt as to what to do next, if the procedure is to follow smoothly its prescribed routine. It can be readily seen that the composition of such a court must be individuals who have a background of previous study of the fundamentals of naval law and are, moreover, imbued with a thorough awareness of the importance of their role in its practical application.

Sources of Naval Law

A detailed knowledge of all the ramifications of naval law is not essential to an officer of the United States Navy but an understanding of the sources of such law may lead to a realization of the sturdiness of its foundations.

In general the sources of naval law are of two types: written and unwritten.

The sources of written naval law are:

The Constitution of the United States

Statutory enactments, including the Articles for the Government of the Navy

Navy Regulations

Order and instructions, including *Naval Courts and Boards*

The sources of unwritten naval law are:

Decisions of the courts

Decisions of the President and the Secretary of the Navy and the opinions of the Attorney General and the Judge Advocate General of the Navy

Court-martial orders

Customs and usages of the Service

The so-called unwritten sources do appear in writing but are not considered as written law since they have not been embodied in statutes, regulations, or orders.

CAPTAIN'S MAST

Procedure

A man is considered to be on the report when he has been placed under arrest or officially informed by proper authority that certain charges have been preferred against him.

The procedure for placing enlisted personnel on report consists of the person who makes the report submitting the report of his charges and necessary details in writing to the executive officer of the ship or station. In some instances the person making the charge may bring the offender before the officer of the deck who makes out the report slip. The police petty officer of the ship, the master-at-arms, serves immediately under the executive officer and may place a man directly on report. (This latter would apply particularly to violations of ship's regulations, such as smoking in restricted places or being out of uniform.) Of course, any commissioned officer or petty officer who sees a breach of discipline either afloat or ashore may place a man on report. For example, if a man were late in returning to his ship from liberty, the officer of the deck would place him

MEN VALUE HIGHLY THEIR SHORE LIBERTY
To deprive a man of his liberty ashore is an effective means of punishment administered at captain's mast.

on the report as he came over the gangway. When the report is received at the executive officer's office it is entered in the Rough Report Book.

Usually the executive officer, when he first arrives at his office in the morning, makes a preliminary investigation of each case reported on the previous day. The master-at-arms rounds up all the delinquents, and in the presence of the reporting officer, the executive officer hears the stories briefly. He may dismiss any cases which seem vague or not well founded. He must assure himself that the man is guilty of an offense of such seriousness as to warrant going to mast.

Usually, after the morning inspection, the executive officer furnishes the commanding officer with a list of the enlisted personnel who were reported for offenses during the preceding day. At a convenient time—aboard ship frequently just before noon—captain's mast is held. On large ships, usually a lee spot on deck, outside the captain's cabin, is selected as the most convenient place. Often the pulpit used in divine services is set up for the captain. On this is placed the big, bound book of record of captain's mast.

The executive officer, who has previously investigated each case, stands by to advise the captain. The executive officer's yeoman stands by with the Service Records of all men brought to mast. Also standing by are the master-at-arms and all witnesses for the accuser and the accused. The accused line up on one side, the reporting officers and division officers on the other.

As each man is called in turn, he steps up before the captain, and uncovers; the reporting officer and the man's division officer also step forward. The offense is read; the captain then hears the man's statement, the reporting officer's statement, and the division officer who may wish to put in a word or whom the captain may wish to question about the man. The man's Service Record is carefully examined by the captain before he makes a decision. During the whole procedure all the dignity and seriousness of a higher court are maintained.

In passing judgment, the commanding officer may dismiss the case if he considers the report unjustified; if the offense is a minor one, he may merely warn the accused; if in his opinion the offense is serious enough to deserve punishment, he may administer sentence immediately.

It should be emphasized that the captain's mast is used to try lesser offenses, and if the commanding officer should decide that the nature of the offense is such that it warrants a greater punishment than he is empowered to administer, he may assign a deck court or summary court-martial, or recommend to the proper authority that the case be tried by a general court-martial. If the case is not considered serious but involves complications which require extended investigation, the captain usually assigns a deck court.

The term "captain's mast" or merely "mast" is derived from the fact that in early sailing days the usual setting for this type of naval justice was on the weather deck at the foot of the ship's mainmast.

Punishments

The commanding officer is limited by *Navy Regulations* in the penalties he may impose. These punishments consist of any one, or part of any one, of the following:

1. Reduction of any rating established by himself (i.e., by the commanding officer of that ship or station)
2. Confinement not exceeding 10 days, unless further confinement be necessary, in the case of a prisoner to be tried by court-martial
3. Solitary confinement, on bread and water, not exceeding 5 days
4. Solitary confinement, not exceeding 7 days
5. Deprivation of liberty on shore
6. Extra duties

A court-martial may not consider any of the above punishments as a previous conviction to be applied subsequently in some other offense. Under no circumstances may an offender be ordered to do guard duty over personnel or material as a punishment.

In the Smooth Report Book, an official record, is entered the action taken by the commanding officer at mast. It is also entered in the man's Service Record and signed by the officer in command.

Whenever expedient, the Navy Department strongly advocates mast punishment rather than that of a higher tribunal. Brevity and directness characterize the procedure. Moreover, the punishment is prompt —always a strong factor in the maintenance of good discipline.

Special Masts

Two additional types of mast are the *request mast* which is held by the executive officer at a specified time to listen to the men having complaints or desirous of requesting special privileges and consideration; and the *meritorious mast* which is held by the commanding officer to commend the action of an enlisted man publicly.

DECK COURTS

Purpose

Since the commanding officer is restricted in awarding punishments to his men, if in his opinion it seems advisable, a deck court may be convened by him for the purpose of imposing greater punishment. Should the offense be of a more serious nature, he may convene a summary court-martial. In an extremely serious matter, he may recommend a general court-martial. (A deck court may be ordered by any officer in the Navy or Marine Corps who is authorized to order a summary court-martial or a general court-martial.)

Deck Court Officer

A deck court consists of one commissioned officer who is called the *deck court officer.* He must hold the rank of lieutenant or above in the Navy and captain or above in the Marine Corps, having had at least six years of commissioned service. If these requirements cannot be met in a particular situation, the commanding officer (if commissioned) may serve as deck court officer. Any officer (if commissioned), irrespective of his rank, may designate himself to act in this capacity, provided he has been empowered to order deck courts. The deck court officer performs his duties under the sanction of his oath of office. The witnesses, testifying under oath, are examined by the deck court officer, who conducts the entire trial. He himself may not be a witness either for the prosecution or for the defense.

SWEARING IN THE RECORDER
A trial by any naval tribunal, from the mast to the general court-martial, is a serious undertaking. Here the recorder is sworn in for duty in a deck court being conducted as part of the training at School of Naval Justice.

Recorder

The recorder, who is sworn to keep a true record of the proceedings, may be any person under the command of the convening authority. Generally this duty is carried out by a competent yeoman.

Punishment

Prior to his trial before a deck court, the enlisted man must indicate his willingness to be tried by such court and sign a statement to that effect in the record. Should he oppose a trial by deck court, he is ordered to appear before a summary or a general court-martial. However, since the punishments awarded by deck courts are less severe than those of higher tribunals, the enlisted man is not likely to object. A deck court is vested with the power to award any *one* of the following punishments:

1. Solitary confinement, not exceeding 20 days, on bread and water or on diminished rations
2. Solitary confinement not exceeding 20 days
3. Confinement not exceeding 20 days

4. Reduction to next inferior rating
5. Deprivation of liberty on shore on foreign station

Extra police duties, and loss of pay, not to exceed 20 days, may be added to any of the above-mentioned punishments.

Record and Disposition

A brief and concise record of a deck court is entered on a deck court card (available on all naval vessels and stations, and also obtainable from the Office of the Judge Advocate General). The deck court officer inscribes thereon the findings and the sentence; all other entries are typewritten. Testimony taken at the trial does not appear on the record card. However, the facts established by the testimony are recorded on separate sheets and submitted to the convening authority for his guidance.

If the accused is acquitted, he is so informed by the deck court officer. If the accused is convicted, he is not informed until the proceedings, findings, and sentence are reviewed by the convening authority, and then only by publication. The publication should be written to reflect the name, rate, and service number of the accused, and the charge, finding, sentence, and the date of approval. Concurrent with such publication, an entry setting forth the same facts and stating that they have been published to the crew should be made in the ship's log. An entry should then be made on page 9 of the man's Service Record, in accordance with the applicable Bureau of Naval Personnel instructions in the premises. Upon the completion of the above, the deck court card is forwarded to the Office of the Judge Advocate General. It should be noted that if the accused is acquitted, there is no publication, no entry of publication in the log, no entry in the Service Record concerning any feature of the offense alleged, but the deck court card is forwarded to the Office of the Judge Advocate General.

Review

All sentences of deck courts may be carried into effect upon approval of the convening authority or his successor in office. He has full power as reviewing authority to remit or mitigate, but not to commute, any sentence, and to pardon any punishment a deck court may adjudge. Until the sentence of the deck court is approved or mitigated, it cannot be carried into effect.

A few words should be inserted here to clear up the meaning of certain legal terms commonly found in naval law:

Remit means literally to give back. Thus in sentences involving loss of pay and confinement, the loss of pay is frequently remitted.

Mitigate means to lessen the severity of a sentence; for example, a sentence of 20 days' solitary confinement may be mitigated to 10 days.

Commute, on the other hand, means to change the nature of the punishment, ordinarily substituting for one penalty another less severe. A sentence of reduction in rating, for example, might be commuted to confinement.

SUMMARY COURTS-MARTIAL

Purpose

Summary courts-martial (note that the plural of *court-martial* is *courts-martial*) may be ordered (convened) by a commanding officer for the trial of petty officers or other enlisted personnel who, in the officer's opinion, warrant a greater punishment than the deck court may award, but not so great as a general court-martial may authorize.

Composition

The members of a summary court-martial include three commissioned officers and one officer recorder. The precept designates the *senior member*, who is always the senior of the three in rank. The three members act both as judge and jury. As judge, they decide on the admissibility of evidence and determine the sentence if the accused is found guilty. As jury,

SUMMARY COURT-MARTIAL
Principals in trial by summary court-martial are shown in this illustration taken at the School of Naval Justice, Port Hueneme, California, where courses are given both for officers and enlisted men.

they weigh the evidence and decide on the guilt or innocence of the accused. The recorder, usually an ensign, acts as prosecuting attorney and conducts the case for the Government.

Procedure

The first steps in the proceedings of a summary court-martial are the preparation of the precept and the specification by the convening officer. The *precept* is the order convening the court. It is signed by the convening authority and addressed to the senior member of the court. It specifies the time and place of meeting and indicates the composition of the court. A *specification* states sufficient facts to constitute an offense, so that the accused may readily understand the charge. In naval law, a specification sets forth the facts constituting an offense for which a man is to be tried.

In order to determine upon a sentence, each member (in writing) states the measure of punishment he believes should be imposed upon the accused and gives his vote to the senior member. The latter reads the votes aloud. If a majority is not reached, he begins with the mildest penalty proposed, reads it aloud, and asks each member, beginning with the junior, "Shall this be the sentence of the court?" Should there be no decision, the senior member obtains a *viva voce* (oral) vote on the punishment next in degree of severity, as before, until a sentence is decided upon.

Punishment

Courts-martial must adjudge a punishment commensurate with the offense. The limit, however, is regulated by law and for summary courts restricted to any *one* of the following:

1. Discharge from the Service with a Bad-Conduct Discharge (see Appendix for types of discharge): but the sentence shall not be carried into effect in a foreign country
2. Solitary confinement, not exceeding 30 days, on bread and water or on diminished rations
3. Solitary confinement not exceeding 30 days
4. Confinement not exceeding 2 months
5. Reduction to next inferior rating
6. Deprivation of liberty on shore on foreign station

Extra police duties, and loss of pay not to exceed 3 months may be added to any of the previously mentioned punishments.

Review

The record, having been signed by the court members and the recorder, is forwarded to the convening authority for action, thence (with rare exceptions) to the reviewing authority (immediate superior in command) for further action. With his approval, the sentence is usually executed immediately, except for certain sentences that require specific prior authorization from the Navy Department.

GENERAL COURTS-MARTIAL

Definition and Purpose

The highest tribunal in naval law is the general court-martial. It may be convened by the President, the Secretary of the Navy, the commander in chief of a fleet or squadron, and the commanding officer of a naval station beyond the continental limits of the United States; and when empowered by the Secretary of the Navy, by the commanding officer of a squadron, division, flotilla, or larger naval force afloat, and of a brigade or larger force of the Naval Service on shore beyond the continental limits of the United States; and in time of war, if then so empowered by the Secretary of the Navy, by the commandant of any naval shipyard or naval station, and by the commanding officer of a brigade or larger force of the Navy or Marine Corps on shore not attached to a naval shipyard or naval station.

A general court-martial is convened for the purpose of trying commissioned officers as well as all other naval personnel. (During World War II there were one or more permanent general courts-martial in each naval district and in certain aviation commands.)

Composition and Procedure

A general court-martial is composed of 5 to 13 commissioned officers and a judge advocate. The senior officer is called the *president*. (If possible, without injury to the Service, not more than one-half of the members, exclusive of the president, are junior to the officer tried.)

The judge advocate is the prosecutor and his duties correspond to those of the recorder of a summary court-martial.

Both summary and general courts-martial are formal trials and a complete transcript is made of all testimony. The accused has the right to be represented by counsel and to call witnesses. He may testify in his own defense although he cannot be required to do so.

Punishment

The maximum punishments which such a court-martial may award are outlined in *Naval Courts and Boards*. The court may impose any of the punishments which an inferior court may impose, plus a sentence of *death, dismissal, dishonorable discharge, or confinement at hard labor in prison.*

Review

The record of a general court-martial is first sent to the convening authority for his action and then forwarded to the Office of the Judge Advocate General where it is reviewed for technical correctness. From there it goes to the Bureau of Naval Personnel where it is reviewed for conformity to bureau policy. This bureau has only the power to *recommend* changes in the record. Next, it is sent to the Secretary of the Navy who has authority to reduce the sentence if he sees fit. If the sentence involves loss of life or dismissal from the Service, the Secretary must send the record to the President with a recommendation that it be executed, remitted, or mitigated. Records not involving the supreme penalty or dismissal from the Service go directly from the Secretary to the Office of the Judge Advocate General. In any case it is to the Office of the Judge Advocate General that any record of a general court-martial is ultimately forwarded and there permanently retained.

PUNISHMENTS INFLICTED ON OFFICERS BY COMMANDING OFFICERS

Types of Punishment

The commanding officer of a vessel is limited by *Navy Regulations* in the punishments which he may inflict on an officer, either commissioned or warrant, under his command. The following are the only such punishments authorized:

1. Private reprimand
2. Suspension from duty
3. Arrest
4. Confinement

No suspension, arrest, or confinement shall continue longer than 10 days unless a further period is necessary to bring the offender to trial by court-martial. The procedure is informal but a report in letter form should be made to the Bureau of Naval Personnel. The officer's fitness report must indicate any punishment made by the commanding officer.

"Under Hack"

The slang term "under hack" is frequently heard in the Navy and it refers to a punishment the commanding officer may inflict upon a commissioned or warrant officer. The officer is said to be "under hack" when he is suspended from duty and restricted in his activities. For example, the commanding officer might order the officer suspended from duty and restricted to his quarters for five days except during meal periods and periods of exercise. *Navy Regulations* state definitely that every suspension, arrest, confinement, and restoration to duty must be entered in the log. Should the commanding officer urgently need the services of the officer in the example above, he could order him immediately back to duty after having the punishment logged and then restrict him to the limits of the ship. In either case, the suspension not only would be logged but would be noted in the officer's fitness report, together with the reasons for the punishment. An admonition or caution in the ordinary course of duty is not considered as a reprimand in the sense of punishment.

COMPARATIVE TABLE OF NAVAL TRIBUNALS

NAME OF COURT:	MAST	DECK COURT	SUMMARY COURT-MARTIAL	GENERAL COURT-MARTIAL
CONVENING AUTHORITY	Commanding officer	Commanding officer or any officer empowered to convene a summary or general court.	Same as deck court	President, Secretary of Navy, the commander-in-chief of a fleet or squadron, and the commanding officer of a naval station beyond the continental limits of the U. S.; and commanding officers specifically authorized by the Secretary of Navy. (Commandants of naval districts in the U. S., the five Functional Air Training Commands and the Commander Amphibious Training Command Atlantic Fleet are now authorized.)
PERSONNEL	Commanding officer	*One* commissioned officer of the rank of lieutenant in the Navy or captain in the Marine Corps or above and of 6 years' service, or the commanding officer. If this is impracticable the convening authority may order any commissioned officer under his command as deck court officer. Also recorder (enlisted man).	*Three* officers not below the rank of ensign as members and an officer recorder, one member to possess qualifications of member of general court-martial.	*Five* to *13* members with rank of lieutenant in the Navy or captain in the Marine Corps or above and a judge advocate. (Half of members senior to accused.)
TO TRY WHAT CASES?	Lesser offenses (enlisted personnel)	Minor offenses (enlisted personnel) meriting greater punishment than commanding officer is empowered to adjudge.	Offenses deserving greater punishment than commanding officer is authorized to inflict but not sufficient to require trial by a general court-martial. (Enlisted personnel.)	Offenses of a serious nature (both officers and enlisted personnel).

DISCIPLINARY LETTERS

Types of Letters

In addition to the punishments that may be awarded by a commanding officer or a general court-martial, an officer may receive one of three types of formal disciplinary letters called letters of censure. These letters, in order of severity are: reprimand, admonition, and caution.

Any one of these letters may originate with the Secretary of the Navy, Chief of Naval Personnel, any fleet or force commander, certain other officers of flag rank, and commanding officers. A commanding officer rarely has occasion to resort to letters of censure since the fitness report affords sufficient means of recording an estimate of officers' performance of duty.

COMPARATIVE TABLE OF NAVAL TRIBUNALS, *Cont.*

NAME OF COURT:	MAST	DECK COURT	SUMMARY COURT-MARTIAL	GENERAL COURT-MARTIAL
PUNISHMENTS	1. Reduction of any rating established by himself. 2. *Confinement* not exceeding *ten* days unless further confinement be necessary in the case of a prisoner to be tried by court-martial. 3. *Solitary confinement on bread and water,* not exceeding *five days.* 4. *Solitary confinement* not exceeding *seven days.* 5. Deprivation of liberty on shore. 6. Extra duties.	1. *Solitary confinement,* not exceeding *twenty days,* on *bread and water* or on diminished rations. 2. *Solitary confinement* not exceeding *twenty days.* 3. *Confinement* not exceeding *twenty days.* 4. *Reduction to next inferior rating.* 5. *Deprivation of liberty* on shore on foreign station. 6. *Extra police duties;* and *loss of pay,* not to exceed *twenty days,* may be added to anv of the above punishments.	1. *Bad-conduct discharge* from service, but not carried into effect in foreign country. 2. *Solitary confinement,* not exceeding *thirty* days, on *bread and water* or on diminished rations. 3. *Solitary confinement* not exceeding *thirty days.* 4. *Confinement* not exceeding *two months.* 5. *Reduction to next inferior rating.* 6. *Deprivation of liberty* on shore on foreign station. 7. *Extra police duties;* and *loss of pay,* not to exceed *three months,* may be added to any of the above punishments.	Any of the punishments that may be awarded by an inferior court, plus *death, dishonorable discharge, confinement at hard labor in a prison,* or other such punishment as the court may direct. Punishments forbidden: flogging, branding, marking, or tattooing on the body.
REVIEWING AUTHORITY	No review	1. Commanding officer or other convening authority. 2. SecNav (JAG and BuPers)	1. Convening authority. 2. Immediate superior in command or senior officer present. 3. SecNav (JAG and BuPers)	1. Convening authority. 2. Judge Advocate General. 3. Chief of Naval Personnel. 4. Secretary of Navy. 5. President of United States. (Death sentence or dismissal of commissioned or warrant officer).

Contents of Letters

Such letters may be recognized by the fact that the subject is usually reprimand, admonition, or caution, as the case may be. The first paragraph in each instance normally describes the offense and the second paragraph carries the reprimand, admonition, or caution. Circular letter No. 2-45 (3 Jan. 1945) specifically states that those commands authorized to address to officers letters of reprimand, admonition, or caution, or any other letter reflecting adversely upon the officer addressed, should include therein a paragraph as follows:

> A copy of this letter will be forwarded to the Bureau of Naval Personnel to be filed with your official record. In accordance with General Order No. 62, you are privileged to forward through official channels to that Bureau for filing such statement concerning this letter as you may desire.

Unfavorable matter is never to be filed in connection with an officer's record without his knowledge and an opportunity to reply thereto. *Navy Regulations*, Art. 1405 (1) reads: "Whenever an accusation is made against an officer, either by report or by indorsement upon a communication, a copy of such report or indorsement shall be furnished him at the time."

Typical Offenses

The following acts of misconduct might be handled by the commanding officer, might lead to a general court-martial, or might elicit any one of the three types of letters referred to above: (1) An officer addressed a letter during the past war to another officer aboard ship, indicating on the envelope the vessel and its location. (2) An officer lost or mislaid classified matter. (3) An officer had the deck at sea and changed the course without advising the commanding officer. (4) An officer had the deck at anchor and failed to be sufficiently alert to realize that the ship was dragging anchor and to take immediate steps to prevent it. (5) An officer came aboard ship in the morning and showed signs of overindulgence in alcoholic beverages.

It is impracticable to assign a particular punishment as appropriate for any particular offense, since it is always necessary to evaluate the offense in the light of all surrounding circumstances and to exercise judgment and discretion in determining what action will, in the circumstances, best serve the interests of the Navy.

The Secretary of the Navy has the authority, in cases of serious misconduct, to discharge from the Naval Service any officer on active duty with less than three years' continuous commissioned service. This might occur in cases where trial by court-martial was impracticable. Such discharges are normally effected after an informal hearing in the Bureau of Naval Personnel at which time the officer is permitted to present written statements in his own behalf and to make such oral statements as he may see fit.

DISCIPLINE AND NAVAL RESERVE OFFICERS

Reservists Subject to Naval Regulations

All members of the Naval Reserve, when employed on active duty, authorized training duty, with or without pay, drill, or other equivalent instruction or duty, or when employed in authorized travel to or from such duty, or appropriate duty, drill, or instruction, or during such time as they may by law be required to perform active duty, or while wearing a uniform prescribed for the Naval Reserve, are subject to the laws, regulations, and orders for the government of the Navy.

Disciplinary Action Not Barred by Release from Duty Status

Disciplinary action for an offense committed while subject to the laws, regulations, and orders for the government of the Navy is not barred by reason of release from duty status of any person charged with the commission thereof.

Members of the Naval Reserve may be retained on or returned to a duty status without their consent, but not for a longer period of time than may be required for disciplinary action.

Discharges of Officers and Enlisted Men

No member of the Naval Reserve on inactive duty may be discharged except upon the expiration of his term of service, or upon his own request, or for full and sufficient cause in the discretion of the Secretary of the Navy, or, in the cases of enlisted men, in the discretion of the Chief of Naval Personnel.

Officers and enlisted men of the Naval Reserve on active duty are subject to separation from the Naval Reserve in the same manner as may be provided by or in pursuance of law for the separation of officers and men of the Regular Navy.

In wartime, officers and enlisted men whose services are determined to be of greater value to the Government in present civilian occupation than they would be if mobilized as Naval Reservists, may be discharged or released to inactive duty upon recommendation by the district commandants, but without prejudice to their later recall, reappointment, or reenlistment in the grade or rate held at the time of discharge provided they are qualified in accordance with current regulations and are needed to fill vacancies in quotas.

Discharge of Officers for Cause

Officers of the Naval Reserve on inactive duty may be discharged by the Secretary of the Navy for full and sufficient cause, including the following:

1. Failure to keep the Bureau of Naval Personnel and the district commandant informed of official residence
2. Failure to reply to official communications
3. Failure to submit such reports as may be required by the Secretary of the Navy
4. Obvious lack of interest

Within a reasonable time prior to discharge for cause, officers shall be given an opportunity to be heard by the Secretary of the Navy, or such administrative authority or other agency as he may designate, which opportunity will be considered as having been given through the mailing of notice to their address on file in the Navy Department.

Officers under consideration for discharge for cause may submit such statement as they desire to the Chief of Naval Personnel via official channels. Officers receiving notification of their pending discharge are also privileged to state their cases in person to the Chief of Naval Personnel, or to the commandant of the naval district, or to such officer attached to the Bureau of Naval Personnel or to the staff of the commandant of the naval district not below the grade of commander as may be assigned such duty by the Chief of Naval Personnel or the commandant. The written statement submitted by the officer will be transmitted to the Secretary of the Navy for his consideration, together with all papers and recommendations in the case.

Officers receiving notification of their pending discharge shall promptly acknowledge same and will be given approximately 30 days, exclusive of the usual length of time required for transmittal of a letter through the mails, in which to prepare a statement or otherwise to be heard. Extensions of time in which to prepare a statement may be granted at the discretion of the Bureau of Naval Personnel.

Routine Administrative Discharges of Officers

Officers of the Naval Reserve on inactive duty may be discharged by the Secretary of the Navy for administrative reasons, including the following:

1. Age in grade
2. Failure to appear for or failure to pass prescribed physical or professional examinations
3. Failure to carry out agreement entered into prior to appointment
4. Civilian occupation incompatible with Naval Reserve status
5. Approval of a claim for a pension, permanent disability allowance or compensation, or retired pay

COURTS OF INQUIRY AND BOARDS OF INVESTIGATION

Purpose

As the names imply, courts of inquiry and boards of investigation are primarily fact-finding bodies. Unless specifically directed by the convening authority to express opinions or make recommendations, they should confine themselves to findings of fact. The proceedings of these bodies are in no sense a trial of an issue or of an accused person; they perform no real judicial function; they are convened solely for the purpose of informing the convening authority in a preliminary way as to the facts involved. Their conclusions are advisory only. The function, therefore, of these bodies is merely to aid the convening authority in the performance of his administrative duties and not to relieve him of the responsibility for his administrative acts.

By Whom Convened

Courts of inquiry may be convened by the President, the Secretary of the Navy, the commander of a fleet or squadron, and by any officer of the Naval Service authorized by law to convene general courts-martial.

Boards of investigation may be ordered by an officer empowered to convene a court of inquiry, by the commander of a division or larger force afloat, and by the senior officer present afloat or ashore.

Membership

The composition of a court of inquiry or a board of investigation, both in regard to rank of members and the corps to which they belong, is regulated by the circumstances to be investigated.

A court of inquiry consists of *not more* than three officers as members and of a judge advocate.

A board of investigation ordinarily consists of three officers as members. A separate recorder may be appointed. If none is appointed, the junior member acts as the recorder in addition to his functions as member.

An investigation is composed of one officer.

When to Be Convened

If there is no doubt as to the facts of any particular incident or occurrence, and no reason that sworn testimony to facts fresh in the minds of witnesses should be preserved, a complete administrative report by the commander concerned will be fully as satisfactory as the record of a court of inquiry or of an investigation could be. But ordinarily, owing to legal sequels, the following should be covered by a court of inquiry or board of investigation: (a) loss of life from accident or under peculiar or doubtful circumstances; (b) serious casualties to or deficiencies in ships; (c) loss or stranding of a ship of the United States Navy; (d) collision with a merchant ship.

Powers of Courts of Inquiry and Boards of Investigation

In general, the powers of a court of inquiry are comparable to those of a general court-martial as regards compelling the attendance of civilian witnesses. The records of formal investigative proceedings may under certain conditions be evidence before courts-martial.

Except as stated above there is no vital difference between a court of inquiry and a board of investigation.

It is appropriate in closing this chapter on discipline and naval law to quote from the "Laws of the Navy," by Captain Ronald Hopwood, R.N.

> Unchartered the rocks that surround thee,
> Take heed that the channels thou learn,
> Lest thy name serve to buoy for another
> That shoal, the Courts-Martial Return.
> Though Armour, the belt that protects her,
> The ship bears the scar on her side;
> It is well if the court acquit thee;
> It were best hadst thou never been tried.

CHAPTER 6

NAVY REGULATIONS AND CUSTOMS—Part I

CUSTOMS

Customs and Regulations

Naval regulations and naval customs are practically synonymous. As a matter of fact, the majority of our present naval regulations have been derived from naval customs developed in the past. Salutes to the quarterdeck, ceremonies for relieving of command, rendering of side honors, precedence of officers in entering boats, visits of courtesy upon reporting to a ship or station, for example, are popularly referred to as naval customs, and yet are now fully covered by specific regulations. It is more than probable that changes or extensions of these regulations in the future will originate from customs that are building up within the Service today. The fact that the Navy recognizes valid customs as having substantially the same effect as regulations, therefore, makes the lack of clear distinction between customs and regulations relatively unimportant. (For example, *Navy Regulations* provides for the ceremonies that are required to be observed by naval personnel on the quarterdeck, yet naval customs dictate no less effectively the steps to be taken to maintain the "sanctity" of the quarterdeck.)

Unfortunately there is no official text for the study of naval customs which have not yet become regulations. They are of limited number, and actual association with the Service is the best means of becoming familiar with them.

Customs and Usage

From time to time, situations arise which are not covered by written rules. Conduct in such cases is governed by customs of the Service. These customs may be likened, in their origin and development, to the portions of the common law of England similarly established. But custom is not to be confused with usage; the former has the force of law, the latter is merely a fact. There may be usage without custom, but there can be no custom unless accompanied by usage.

The principal conditions to be fulfilled in order to constitute a valid custom are: The act or behavior must be long and consistently continued; it must be well defined and uniformly adhered to; it must be generally accepted so as to seem almost compulsory; and it must not be in opposition to the terms and provisions of a statute, lawful regulation, or order.

It is the obligatory force which attaches to custom that enables it finally to ripen into law. That a custom has legal status is evidenced in the following quotation from *Naval Courts and Boards*: "A specification [which details the offense] must on its face allege facts which constitute a violation of some law, regulation, or custom of the service."

Foreign customs also have a legal status. *Navy Regulations* reads: "The religious institutions and customs of foreign countries visited by persons in the naval service shall be respected."

In the establishment of custom, on the other hand, omission is sometimes as important as commission. Long-continued nonusage may operate to deprive a particular custom of its obligatory character. Some customs, indeed, have the form of "do not" rather than "do." Taboos are often more stringently enforced than customs. The breach of some naval customs merely brands the offender as ill-bred; the violation of others brings disciplinary action.

Customs and Tradition

Customs are closely linked with tradition, and on their continued maintenance much of the *esprit de corps* of the Naval Service depends. Many of these customs have been passed on to us from great navies of the world, especially the British. But the customs which we have adopted have been supplemented by a tradition which is our own. Customs unwritten but none the less potent factors in the government of the Navy, which time and experience have proved to make for better order, discipline, and increased efficiency, have, in obedience to a natural law, changed their form by being merged into written regulations.

Our naval tradition, on the other hand, has been developed from the performance of our own naval personnel. No one knew better than John Paul Jones the importance of great tradition. Thus, in the battle against the *Serapis,* he created two of the great American traditions by showing that he didn't know when he was beaten, and later by generously returning to the British captain the sword which his daring behavior had won. Jones was preeminent among our tradition makers and marked the way for a memorable group to follow—Truxtun, Preble, Macdonough, Lawrence, Porter, Farragut, and Dewey. The traditions of our Navy spring from the gallant deeds of our officers and men. Our customs are patterns of behavior which we have developed for ourselves or borrowed from others.

A LINK WITH THE PAST
Many of our present-day naval customs were in force aboard Lord Nelson's flagship, HMS *Victory*, shown above. Midshipmen leaving it are on summer cruise. The historic vessel is tied up at Portsmouth, England.

NAVY REGULATIONS

Regulations—1775

The first American regulations for the Navy, known as Rules for the Regulation of the Navy of the United Colonies, were in force throughout most of the Revolution. They were written by John Adams, always vitally interested in naval affairs and at this time a member of the Naval Committee. Fortunately, before the fleet put out to sea, the committee foresaw the problems that would inevitably arise relating to discipline, the condemnation of prizes, the authority and responsibility of officers, and many other matters, all of which were thoroughly covered by the new regulations. Naturally Adams turned to the rules of the navy of the mother country for a model, since these regulations had been adequate for the greatest naval service in the world. It is interesting to note that at a later date our Navy Department was created and that the foundation of our present Navy was laid when Adams, who had done so much for the Navy during the Revolution, became President of the United States.

These early regulations, eight pages in length, were brief indeed compared to the present volume. More than one-half of the Navy's first Rules were concerned with the ordinary seaman—his food, care, duties, rights, and punishments; many of the articles in *Navy Regulations* today apply to officers and to naval administration.

Some Interesting Provisions

While the Rules of 1775 are discussed later in this chapter, certain interesting provisions may be noted at this point.

It was the duty of commanders of ships to see to it that "divine service be performed twice a day on board, and a sermon preached on Sunday" unless uncontrollable circumstances prevented it.

The punishment for swearing consisted of wearing a "wooden collar, or some other shameful badge of distinction"; a commissioned officer was required to forfeit one shilling for each offense, and a warrant or inferior officer sixpence. The most extreme punishment which an officer could inflict on a seaman was "twelve lashes upon his bare back, with a cat of nine tails." If it was felt that a more severe punishment was deserved, a court-martial could be convened. A seaman guilty of drunkenness was put in irons and kept there until sober; for this same offense, an officer forfeited two days' pay.

As to Navy "chow," our forefathers made good use of the bounties of the sea and solved a manpower problem locally. The early rules provided that on all ships furnished with fishing tackle, "the captain is to employ some of the company in fishing; the fish to be distributed daily to such persons as are sick . . . and the surplus by turns amongst the messes of officers and seamen without favor or partiality and gratis, without any deduction of their allowance of provisions on that account."

GOOD FOOD HAS BECOME A TRADITION IN THE NAVY
We have come a long way from the Rules of 1775 which provided that the captain was to employ some of the ship's company in fishing, to supplement the daily food ration.

The exact amount of food for each man each day of the week was provided. For example, Sunday's bill of fare consisted of "1 lb. bread, 1 lb. beef, 1 lb. potatoes or turnips"; the menu for Monday offered "1 lb. bread, 1 lb. pork, ½ pint peas and four oz. cheese." Each seaman was allowed a half-pint of rum per day and "discretionary allowances on extra duty and in time of engagement."

Of the sixteen naval offices established, only two, captain and lieutenant, were commissioned. Five marine offices also were established, the highest being captain. The monthly pay ranged from $6.67 for able seamen and Marine privates to $32.00 for naval captains. It should be added that it was the expectation of Congress and the hope of the men that the capture of prizes would substantially supplement the official salaries. John Paul Jones's poster, which appeared throughout New England seeking "gentlemen seamen" for the *Ranger*, suggested that the men could "distinguish themselves in the glorious cause of their country and make their fortunes" as well.

Naval Policy During the Revolution

The committee of Congress which directed and administered the Navy during the Revolution repeatedly enjoined upon commanders of ships the duty of strictly obeying the Rules. Letters of Instruction to Captains usually ended with an injunction such as the following: "Use your people well, but preserve strict discipline; treat prisoners, if any you make, with humanity; and in all things be duly attentive to the honor and interest of America." The committee encouraged boldness, as will be shown by the following characteristic exhortation to a commanding officer: "Although we recommend your taking good care of your vessels and people, yet we should deem it more praiseworthy in an officer to lose his vessel in a bold enterprise than to lose a good prize by too timid a conduct." The tradition of the offensive in the Navy is older than the nation itself. The spirit of discipline, humanity, and enterprise evident in the two quotations is a part of that tradition. Although warships have changed vastly, and crews are many times larger than in the old days, the spirit of the Navy has remained the same.

Subsequent Regulations

For a period following the Revolutionary War, the Navy ceased to exist; the last ship had been disposed of in 1785. When the Constitution of the United States went into effect in 1789 there was no American Navy in existence. However, an international situation developed which made the reestablishment of a navy imperative. So, in 1794, a modest navy was provided for under the War Department, and in 1798 a Navy Department was created. This, in a sense, marks the formal beginning of the Navy of the United States. The naval regulations that were adopted in 1799 were based on the Rules for the Regulation of the Navy of the United Colonies (1775). Since that time, more than a score of new editions have been issued by the Navy Department to meet the changing conditions and requirements of a vast and growing service. *Navy Regulations* in 1818 was a bound volume known as the "Blue Book"; in 1832 it was called the "Red Book"; in 1909 it again became the "Blue Book."

Modification of the early statutes appeared more frequently, of course, during periods of great change. For example, no less than four new editions were issued in the ten years between 1860 and 1870 when naval design and naval tactics were changing rapidly, while only two new sets appeared during the seventeen years of relative naval stagnation between 1876 and 1893.

The present system of printing single pages to be inserted in a loose-leaf binder was introduced in 1913 in order to facilitate changes that at that time were rapidly occurring in the regulations of the Navy.

As a result of World War I, the 1920 edition was published and remained in force until superseded by the revision of 1948.

FIRST CHAPLAIN OF THE NAVAL ACADEMY

Chaplain George Jones was influential in introducing the serving of coffee in the United States Navy. This was in 1842 and since that time coffee has attained nearly the status of a naval tradition.

NAVY REGULATIONS—1948 EDITION

The Newest Edition

Today the regulations for the government of all personnel attached to the Naval Service are those of the 1948 edition of *Navy Regulations*. This loose-leaf volume is issued by the Secretary of the Navy and approved by the President of the United States. The new volume is less formidable both in size and format than was the bulky edition of 1920. Much of the material that appeared in the earlier book has been deleted and now appears in the appropriate bureau manual.

The principal purpose of the publication is to communicate to the Naval Establishment the rules under which it shall operate. Among these rules are found the answers to almost all problems of principle. These regulations set forth the duty, responsibility, authority, distinction, and relation of the various bureaus, offices, and individual officers, each to the other. It is the most important of the administrative publications of the Navy and is never contravened by other naval publications. Details coming exclusively under the cognizance of a particular bureau or office are incorporated in that bureau or office manual. In general, *Navy Regulations* deals with principles, while the method of applying those principles is set forth in the cognizant bureau or office manual.

Changes in Navy Regulations

Changes in *Navy Regulations* are published in the form of loose-leaf sheets from time to time. (Advance changes are often made by letter.) No proposed change may be submitted to the Secretary of the Navy for approval until it has been referred to the Chief of Naval Operations and to all bureaus, to the Office of the Judge Advocate General, and to the Commandant of the Marine Corps. (The written comment of each bureau or office is brought to the Secretary's attention at the time the suggested change is submitted.) The President must finally approve all changes. *Navy Regulations* is prepared, revised, and recorded by the Chief of Naval Operations.

Reasons for Changes in the Regulations

Obsolete or unnecessary regulations are deleted, for they greatly weaken the standing and authority of the essential ones. To be effective, regulations should be concise, should not attempt to cover every detail, and should be changed only for adequate reasons. Permanence is a valuable asset in many respects, provided it does not degenerate into a stagnating conservatism. The rules (approximately 40 paragraphs) which were sufficient to govern the Navy when it consisted of a few relatively small sailing vessels would obviously be inadequate today with the advent of steam, electricity, and radio communication. Inventions such as submarines, torpedoes, airplanes, and long-range guns have necessitated many new varieties of specialized knowledge and skill. With the increased complexity of the Navy, a greater need for defining the precise functions, duties, and rights of personnel arises.

Regulations, in any event, would not have remained static. Changes and reforms of many kinds were in the air in the 19th century. For example, the death knell sounded for two long-honored naval customs about the middle of the century. The early regulations had sanctioned flogging, and a captain was permitted to award twelve lashes upon the bare back with a cat-o'-nine-tails. Since men were often mangled and crippled for the rest of their lives, especially when the lashes were "well laid on," as the ancient phrase ran, much opposition was raised to this cruel punishment, and it was finally abolished by Congress in 1850. Many objections had also arisen to the spirit ration, frequently referred to as "grog," which was authorized from the earliest days of the Navy. During the 18th century, sailors had sung:

> For grog is our starboard, our larboard,
> Our mainmast, our mizen, our log—
> At sea, or ashore, or when harbour'd,
> The mariner's compass is grog.

However, in 1862, the spirit ration which consisted of "two dips" a day was abolished, and in its place the men were given a commutation of a few cents per day. Sailors have a way of expressing their laments in song and the new refrain ran:

> They raised our pay six cents a day,
> But stopped our grog forever.

Today punishment by flogging and the use of irons (as well as the issue of grog) are forbidden under *Navy Regulations*.

ARTICLES FOR THE GOVERNMENT OF THE UNITED STATES NAVY

Importance of the Articles

Since the Articles for the Government of the Navy (AGN) constitute in a sense the core of *Navy Regulations*, they merit detailed consideration. The remaining pages of this chapter are devoted to a discussion of AGN, complete text of which appears in the Appendix of this book. The other chapters of *Navy Regulations* are treated briefly in Chapter 7.

The Articles are the fundamental law of the United States Navy. Approved by Congress and thus made into law for the government of the Navy, they are the keystone of the naval disciplinary system. (According to the Constitution, Congress has the power "to make rules for the government and regulations of the land and naval forces.") The general features of the remainder of *Navy Regulations* are founded on the Articles and are issued on the authority of the President. (The President as Commander in Chief is authorized to issue personally or through his military subordinates such orders and directives as are necessary and proper to insure order and discipline in the Navy.)

The fact that the Articles are required "to be hung up in some public part of the ship and read once a month to the ship's company" is a clear indication of their importance and of the necessity for everyone in the Navy to be thoroughly familiar with them. In a sense, they are the charter of the rights, duties, obligations, and privileges of the officers and men. These articles of war and peace compose the "constitution" of the Navy and from them naval regulations and instructions have been derived. They are the so-called "Rocks and Shoals" and may be said to bear the same relationships to *Navy Regulations* as do the Ten Commandments to the *Old Testament.* The process of reading and interpreting the Articles continues throughout the naval career of all commissioned and enlisted personnel.

"Rules" in 1775—"Articles" Today

Although the current *Navy Regulations* constitutes a volume considerably larger than the early Rules for the Regulation of the Navy of the United Colonies, nevertheless the fundamental law, the "constitution," as we have called it, remains much the same as at the beginning of our Navy. The Rules for the Regulation of the Navy of the United Colonies fill a little more than one-third of the space occupied by today's Articles. The provisions of the present Articles are more numerous, more detailed, and the arrangement is more orderly and logical. In many instances, the language is practically the same and few new subjects have been added. On the other hand, there are several omissions; for example, the Rules of 1775 contain paragraphs relating to the food, pay, and other matters that now have no place in the fundamental law of the Navy. Thus the regulations relating to morals and conduct have undergone few changes; those relating to material and organization have been expanded tremendously.

A brief comparison of the present Articles for the Government of the Navy with the Rules of 1775 will show conclusively that a large part of the code embraced in the rules and regulations of 1775 has been retained. Three concrete examples will serve as illustrations. The most striking instance of practical identity is found in the first article, which expresses the animating spirit of the Navy. (See also page 90.)

> *1775 Edition*—The commanders of all ships and vessels belonging to the Thirteen United Colonies are strictly required to shew in themselves a good example of honor and virtue to their officers and men, and to be very vigilant in inspecting the behaviour of all such as are under them, and to discountenance and suppress all dissolute, immoral and disorderly practices; and also, such as are contrary to the rules of discipline and obedience, and to correct those who are guilty of the same according to the usage of the sea.
>
> *1948 Edition*—The commanders of all fleets, squadrons, naval stations, and vessels belonging to the Navy, are required to show in themselves a good example of virtue, honor, patriotism, and subordination; to be vigilant in inspecting the conduct of all persons who are placed under their command; to guard against and suppress all dissolute and immoral practices, and to correct, according to the laws and regulations of the Navy, all persons who are guilty of them; and any such commander who offends against this article shall be punished as a court-martial may direct.
>
> *1775 Edition*—The officer who commands by accident of the Captain's absence (unless he be absent for a time by leave) shall not order any correction but confinement; and upon the Captain's return on board he shall then give an account of his reasons for so doing.
>
> *1948 Edition*—No officer who may command by accident, or in the absence of the commanding officer, except when such commanding officer is absent for a time by leave, shall inflict any other punishment than confinement.
>
> *1775 Edition*—The Captain is to cause the articles of war to be hung up in some public place of the ship, and read to the ship's company once a month.
>
> *1948 Edition*—He [the Captain] shall cause the articles for the government of the Navy to be hung up in some public part of the ship and read once a month to his ship's company.

Punishment was provided in the early rules (note similarity today) for those who "shall begin, excite, cause or join in any mutiny or sedition"; those who "swear, curse, or blaspheme the name of God"; those who strike their superior officers; those who sleep on watch; those who disobey orders; those who "behave themselves faintly" in battle; those who "cry for quarters"; those who "basely desert their duty or station; those who are guilty of murder, theft [sails and anchors are specifically mentioned], quarrelling, and so on." A court-martial might inflict death for desertion, mutiny, or murder. Thus, the general principles of discipline controlling the officers and men in the days of John Paul Jones have had continuous life and force.

There is inspiration to be gained through acquaintance with the Rules of 1775. The statement on their cover characterizes the spirit which pervades them. It assured the patriots who joined the colors that the regulations were "Established for Preserving their Rights and Defending their Liberties, and for Encouraging all those who Feel for their Country, to enter into its Service in that way in which they can be most Useful."

And now let us turn to the Articles for the Government of the Navy as they exist today.

Discussion of Some Articles

Since the Articles are conspicuously posted and read to all hands once each month, it will be necessary in brief review to make only certain observations regarding them.

Article 1 definitely states that officers in command throughout the Navy must deport themselves so as to set an "example of virtue, honor, patriotism, and subordination." Thus there has been placed upon them the obligation to guide, influence, and mold subordinates. They must practice what they preach, for the philosophy of "Don't do as I do, do as I say" is taboo in the Navy. Note the importance of subordination. The commanding officer is expected to show the same respect and obedience to his superiors as he expects from those under his command.

Moreover, he is to *inspect* the conduct of all persons under him—not merely assume responsibility for it. He not only corrects, but *suppresses* and *guards against* certain practices. For example, he must provide adequate recreational facilities for his men and thus *prevent* trouble which might otherwise arise.

DIVINE SERVICES ABOARD USS *MISSOURI*
Navy Regulations requires that divine services be held on Sunday if possible. A suitable space must be provided and properly rigged for the occasion.

While freedom of religious belief is part of the foundation of our Government, it is not to be interpreted in the Navy as encouraging atheism. Indeed, article 2 specifically places the responsibility on commanders of vessels and naval stations (where chaplains are attached) to "cause divine service to be performed on Sunday whenever the weather and other circumstances allow it to be done." Where there is no chaplain attached, the commanding officer may desire to conduct divine services himself or designate (or permit) someone else to do so. For example, a chaplain who is a passenger on a ship may conduct services. Moreover, all naval personnel are "earnestly recommended" to attend diligently at "every performance of the worship of Almighty God."

Although commanding officers may encourage attendance at religious services on a voluntary basis, no coercion or discrimination of any kind is sanctioned to compel such attendance.

Finally, in article 3 it is stated that any irreverent behavior during divine service is strictly forbidden. Articles 2 and 3 read:

> The commanders of vessels and naval stations to which chaplains are attached shall cause divine service to be performed on Sunday, whenever the weather and other circumstances allow it to be done; and it is earnestly recommended to all officers, seamen, and others in the naval service

> diligently to attend at every performance of the worship of Almighty God.
>
> Any irreverent or unbecoming behavior during divine service shall be punished as a court-martial may direct.

Article 4 goes into detail regarding the standard of conduct expected in time of war or battle. The most formidable first impression of this article is the death penalty, but it should be noted that the significance of this article lies in the words "such other punishment as a court-martial may adjudge." Since the beginning of our Navy, the law has been interpreted to mean that "such other punishment" is limited by the custom of the Service, and only such punishments as are *usual* are authorized. The Articles themselves prohibit inhuman, extreme, or unusual punishments.

Naval history is filled with events that exemplify the principles embodied in this article. It would be difficult for any master of the English language to improve upon the clearness, conciseness, and directness of expression employed in these phrases.

Paragraph 1 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who makes, or attempts to make, or unites with any mutiny or mutinous assembly, or, being witness to or present at any mutiny, does not do his utmost to suppress it; or, knowing of any mutinous assembly or of any intended mutiny, does not immediately communicate his knowledge to his superior or commanding officer.

In the late years of the 18th century, mutiny presented a serious problem in some of the navies of the world. Pirates were still on the high seas, and it was a temptation for a crew to mutiny, take over the ship, and go pirating. It is notable that no United States man-of-war has ever mutinied or been in the hands of mutineers, while in other navies whole squadrons and fleets have mutinied.

However, in 1842, the well-known mutinous incident occurred in the United States Navy on the brig-of-war *Somers*. It constitutes our only approach to mutiny. The plot was hatched in the brain of Midshipman Philip Spencer, an ill-balanced youth, son of the Secretary of War. When the plot was revealed to Commander Alexander Slidell Mackenzie, a stern and pious officer, he immediately arrested Spencer and two other alleged leaders. A court of ship's officers promptly declared them guilty of "attempting mutiny" and the three were hanged at the yardarm. A dignified ceremony followed. On a rough sea and by lantern light, the bodies of the three were committed to the deep. (Captain Mackenzie, who did not have the President's approval for these executions, was court-martialed on several charges when he returned to the United States, but was acquitted.)

Paragraph 8 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who sleeps upon his watch.

Ever since man first went down to the sea in ships, sleeping on watch has been a most serious offense, for clearly the offender endangers the lives of his fellowmen or even the security of the nation itself. In war, and especially under modern wartime condi-

CAREFUL INSPECTIONS ARE A NECESSITY
An observant inspecting officer can correct many errors before they grow into court-martial offenses.

tions at sea, the crew seldom gets sufficient sleep. The wise officer will resort to practical, positive measures to keep the watch awake, rather than rely on the threat of the death penalty for sleeping on watch.

Paragraph 9 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who leaves his station before being regularly relieved.

Here is a positive order to remain at one's post until properly relieved. If we consider the disastrous consequences which might result in loss of life and property if one left his post before someone else assumed the responsibility, we can readily understand why this provision is emphasized.

Few young men in civil life, for example, are called upon to accept responsibilities as heavy as those of the officer of the deck of a man-of-war at sea. There is no counterpart in any other military service. An officer assumes a great obligation when he takes over the deck and utters those simple words, "I relieve you, sir."

Paragraph 11 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who unlawfully sets on fire, or otherwise unlawfully destroys, any public property not at the time in possession of an enemy, pirate, or rebel.

The seriousness of the act of destroying government property is emphasized in this paragraph. This article applies to all items of government equipment with which naval personnel may come in contact in the course of their work ashore or afloat. It is applicable to a textbook issued a student in a naval training school, and equally applicable to every item of equipment on a battleship.

Paragraph 12 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who strikes or attempts to strike the flag to an enemy or rebel, without proper authority, or, when engaged in battle, treacherously yields or pusillanimously cries for quarter.

This paragraph brings to mind John Paul Jones and a near disaster in 1779 when the *Bonhomme Richard* fought the *Serapis*. At a decisive stage of the battle, a gunner in a state of panic loudly clamored for quarter and rushed to haul down the colors. According to the Rules, the man was subject to court-martial, but Jones, being forced to act immediately, hurled a pistol at the fellow, breaking his skull, and thus rendered the decision.

Paragraph 13 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who in time of battle, displays cowardice, negligence, or disaffection, or withdraws from or keeps out of danger to which he should expose himself.

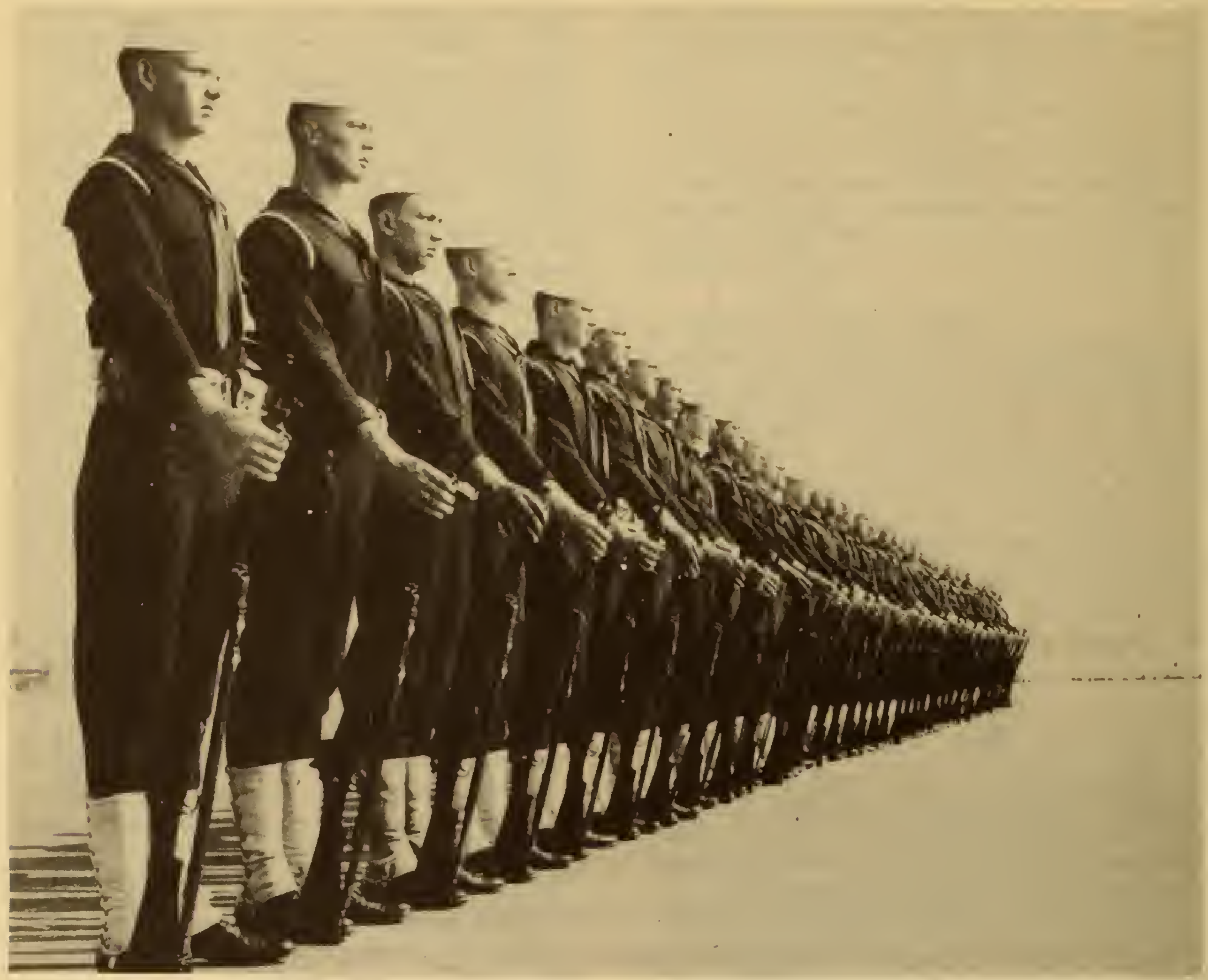
A similar article (except that death was mandatory) was responsible nearly two centuries ago for the tragic death of a British admiral who was executed on the quarterdeck of one of his ships in accordance with the sentence of a court-martial which found him guilty of failing to do his utmost to capture and destroy an enemy fleet. The case was that of Admiral Byng, in his engagement with the French Fleet off Port Mahon, 20 May 1756. Strangely enough, the cause of his failure was not cowardice, but a too liberal adherence to "Fighting Instructions" which, combined with bad judgment, kept him from engaging the enemy with full force when once joined in battle.

In 1799, in our own Navy an officer on Truxtun's ship killed a man for displaying cowardice during a battle. Standing firm to one's post in battle has long been a tradition of the Service.

Paragraph 16 (article 4) reads:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who being in command of a fleet, squadron, or vessel acting singly, neglects, when an engagement is probable, or when an armed vessel of an enemy or rebel is in sight, to prepare and clear his ship or ships for action.

In accordance with the above article Captain James Barron was tried by a court-martial early in the 19th century. The trial occurred in connection with the *Chesapeake-Leopard* affair (1807) at a time when American-British relations were strained. As the *Chesapeake*, in command of Captain Barron, was leaving



PARADE REST

A smartly turned-out crew is the product of discipline and adherence to the rules and regulations.

Hampton Roads for the Mediterranean, the *Leopard* stopped her and demanded the release of certain British deserters. At the Americans' refusal, the British promptly opened fire. Since the *Chesapeake* was not prepared for action, and the captain appeared to lack initiative and resolution, her colors were hastily hauled down. As a result of the American ship's tame submission, Barron was tried and found guilty of "neglecting, on the probability of an engagement, to clear ship for action."

Paragraphs 17 and 20 (article 4) read:

> The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service who does not, upon signal for battle, use his utmost exertions to join in battle; or does not afford all practicable relief and assistance to vessels belonging to the United States or their allies when engaged in battle.

These two sections recall to mind the controversy that took place after the Battle of Lake Erie. Many claimed that Captain Elliott of the *Niagara* failed to support Commodore Perry at a critical stage in the battle. No court-martial, however, resulted. Since that time the wording of the sections in AGN covering such situations has been clarified, and there can no longer be any question as to one's duty at such a time.

A careful inspection of articles 4, 5, and 6 will disclose that there are 22 different offenses of such serious nature that a court-martial may adjudge the death penalty. Briefly summarized these offenses are:

1. Mutiny
2. Disobedience of orders
3. Striking superior officer
4. Intercourse with an enemy
5. Unlawfully receiving messages from an enemy
6. Desertion in time of war
7. Deserting trust in time of war
8. Sleeping on watch
9. Leaving station before being regularly relieved
10. Willful stranding or injury to vessels
11. Unlawful destruction of public property
12. Striking flag or treacherously yielding or pusillanimously crying for quarter
13. Cowardice in battle
14. Deserting duty in battle
15. Neglecting orders to prepare for battle
16. Neglecting to clear for action
17. Neglecting to join on signal for battle
18. Failing to encourage men to fight
19. Failing to seek encounter
20. Failing to afford relief in battle
21. Spying in time of war
22. Murder

Article 8 lists a number of offenses which may be punished as a court-martial may adjudge.

Paragraph 1 of article 8 reads:

> Such punishment as a court-martial may adjudge may be inflicted on any person in the Navy who is guilty of profane swearing, falsehood, drunkenness, gambling, fraud, theft, or any other scandalous conduct tending to the destruction of good morals.

The vices mentioned above have always been serious offenses in the navies of the world. For example, 300 years ago in the British Navy, blaspheming was punished by burning the tongue of the offender with a hot iron.

It should be emphasized at this point that violations of this article are court-martial offenses whether one is on duty aboard ship, on liberty, or on leave. Drunkenness on liberty is one of the most common court-martial offenses in the Navy.

Before leaving paragraph 1 (article 8) it should be noted that it provides that scandalous conduct tending to the destruction of good morals is also punishable at the discretion of a court-martial. Offenses of a scandalous nature are indeed diverse. Since many attempted or uncompleted offenses are not elsewhere specified, most such, involving scandalous acts, are placed under this general charge.

Paragraph 2 of article 8 reads:

> Such punishment as a court-martial may adjudge may be inflicted on any person in the Navy who is guilty of cruelty toward, or oppression or maltreatment of, any person subject to his orders.

A survey of the court-martial records of 70 or 80 years ago discloses a number of cases where officers were tried for physical cruelty toward and maltreatment of persons under their command. While such cases do not exist today, the obligation to deal justly remains as binding as when the article was first written.

Many other paragraphs in article 8 are noteworthy for they point out a great number of offenses punishable at the discretion of a court-martial. A court-martial is empowered to mete out punishment to one who "quarrels with, strikes, or assaults" any person in the Navy; who "treats his superior officer with contempt, or is disrespectful to him in language or deportment, while in the execution of his office"; who is "negligent or careless in obeying orders, or culpably inefficient or careless in the performance of duty"; who "knowingly makes or signs, or aids, abets, directs, or procures the making or signing of, any false muster." (In view of the extreme importance of this paragraph, it might be well to reread it. It contains several "rocks and shoals" which have brought disaster to more than one individual in the Service.)

Paragraph 5 (article 8) reads:

> Such punishment as a court-martial may adjudge may be inflicted on any person in the Navy who sends or accepts a challenge to fight a duel or acts as a second in a duel.

This paragraph was inserted into the Articles in 1862 to end a barbarous practice. Dueling was so prevalent in the early 19th century that one historian alleges that more officers were killed in this manner than in the naval actions of the period. Perhaps no other single incident in naval history shocked the American people more than the tragic death of the country's idol, Stephen Decatur, at the hands of Commodore James Barron in 1820.

Paragraph 19 (article 8) reads:

> Such punishment as a court-martial may adjudge may be inflicted on any person in the Navy who is absent from his station or duty without leave, or after his leave has expired.

This is the offense most frequently committed by enlisted men. It takes numerous forms, varying in degree from the man who is delayed for a short period of time in returning to the ship, to the man who deliberately remains out for months or years.

Overstaying leave because of oversleeping, for example, involves neglect on the individual's part and is a serious offense. The offender should get back to his ship or station as quickly as possible. Overstaying leave deliberately—for any reason whatever—is a most serious offense, since it defies authority.

When a man has *deliberately* missed the sailing of his ship or mobile unit in order to avoid service thereon or therein, adequate disciplinary action is mandatory, and trial by general court-martial is considered appropriate regardless of the length of absence.

In time of war, missing ship, except, under most unusual circumstances, regardless of the length of absence, is an offense warranting trial by a general court-martial.

Article 10 reads:

> Any commissioned officer of the Navy or Marine Corps who, having tendered his resignation, quits his post or proper duties without leave, and with intent to remain permanently absent therefrom, prior to due notice of the acceptance of such resignation, shall be deemed and punished as a deserter.

This article stresses the importance of remaining on duty until officially notified that resignation has been accepted. Except in special cases, resignations are not accepted in wartime.

Article 12 reads:

> No person connected with the Navy shall, under any pretense, import in a public vessel any article which is liable to the payment of duty.

An officer must be careful that he himself does not disobey this injunction. In addition, he must use preventive measures with his men. A young officer may find himself in difficulties if he is not vigilant in observing the requirements of this article.

Article 13 reads:

> Distilled spirits shall be admitted on board vessels of war only upon the order and under the control of the medical officers of such vessels, and to be used only for medical purposes.

Early in the Civil War, the issue of the spirit ration was terminated and each enlisted man received an additional few cents a day in pay. At the same time, the introduction of distilled spirituous liquor on board vessels of war was forbidden. So prohibition in our Navy is not a recent development.

Article 19 applies particularly to the duties and obligations of recruiting officers. It reads in the following manner:

> Any officer who knowingly enlists into the naval service any person who has deserted in time of war from the naval or military service of the United States, or any insane or intoxicated person, or any minor between the ages of 14 and 18 years, without the consent of his parents or guardian, or any minor under the age of 14 years, shall be punished as a court-martial may direct.

The problems faced by recruiting officers today are vastly different from those experienced in 1798 when the present Navy was founded. In the latter year no bureau ordered men to a ship, but the captain of each vessel was given the responsibility of recruiting his own crew. An official directive to Captain Thomas Truxtun ordered him "to open Houses of Rendezvous in proper Places" to engage his seamen.

Careful selection of recruits was in evidence in 1798. One early directive read: "It being essential that those who enlist, should feel an Inclination for that kind of Life, no indirect Methods are allowable to inveigle Men into the Service of the United States; it is forbidden therefore to inlist any Individual while in a State of Intoxication, or to have him sworn until twenty four hours after he shall have signed the Inlistment." A physical examination was necessary and a surgeon was required to certify that the men were "well organized, healthy, robust, and free from scorbutic and consumptive affections" before they could be accepted or an advance in pay made. Captain Truxtun's advice to an officer who was recruiting men in Baltimore for the *Constellation* which was soon to make history was: "Every expence attending the rendezvous for fire, candle, Liquor, house rent &c &c, must not exceed one dollar for every man actually entered & received on board—you must come to a clear understanding with Mr. Cloney [owner of the house] on this subject, before you open the rendezvous. A reasonable allowance [Truxtun quaintly added] will be made you for music to indulge and humour the Johns in a farewell frolic."

Article 20 lays down certain fundamental rules which must be obeyed by the commanding officer of a vessel. (Chapter 7 in *Navy Regulations*, entitled "The Commanding Officer" outlines his responsibilities and duties in detail.)

Paragraphs 7 and 8 (article 20) which are closely related are as follows:

> Every commanding officer of a vessel in the Navy shall obey the following rules:
>
> He shall cause frequent inspections to be made into the condition of the provisions on his ship, and use every precaution for their preservation.
>
> He shall frequently consult with the surgeon in regard to the sanitary condition of his crew, and shall use all proper means to preserve their health. And he shall cause a convenient place to be set apart for sick or disabled men, to which he shall have them removed, with their hammocks and bedding, when the surgeon so advises, and shall direct that some of the crew attend them and keep the place clean.

AN EVENING'S RECREATION

The Articles are concerned with the welfare of the men. A well-rounded athletic program is one phase of the recreation provided for men of the United States Navy.

You will note that paragraphs 7 and 8 bestow upon the commanding officer responsibility for watching over the health of his crew by providing for frequent inspection of provisions on board and by consulting with the surgeon in regard to sanitary conditions. The commanding officer's duty in this connection has been made easier by modern developments in the fields of transportation and refrigeration.

In sailing days, poor food and drink were frequently the cause of discontent and illness on board. One individual, referring to naval conditions around 1800, said that in "spite of all the fumigations the ships were never free from unpleasant smells; the dank musty smell of dry-rot, the acrid and awful smell of bilge water, and the smells of decaying stores and long defunct rats." Somewhat earlier it was reported: "When we had one man dyed by shot in the Navy we had ten dyed by means of bad provisions." Fortunately these days are past and today the health of the personnel on board our ships is ordinarily phenomenally good.

Paragraph 10 (article 20) reads as follows:

> Every commanding officer of a vessel in the Navy shall obey the following rules:
>
> He shall cause the Articles for the Government of the Navy to be hung up in some public part of the ship and read once a month to his ship's company.

Here is reemphasized the necessity now, as in 1775, for naval personnel to understand fully their obligations, their duties, their rights, and their privileges as clearly and directly stated in the Articles.

Article 21 reads:

> When the crew of any vessel of the United States are separated from their vessel by means of her wreck, loss, or destruction, all the command and authority given to the officers of such vessel shall remain in full force until such ship's company shall be regularly discharged from or ordered again into service, or until a court-martial or court of inquiry shall be held to inquire into the loss of said vessel. And if any officer or man, after such wreck, loss, or destruction, acts contrary to the discipline of the Navy, he shall be punished as a court-martial may direct.

NO IDLERS HERE
Many court-martial offenses have their origin in idleness. A busy bluejacket is not likely to get into mischief.

This article offers some interesting possibilities for speculation: What limit, for example, should be placed on it? Suppose the crew were stranded on an island and never rescued?

In order to provide for exigencies which might occur, yet for which no specific rules have been laid down, article 22(a) has been included. It reads:

> All offenses committed by persons belonging to the Navy which are not specified in the foregoing articles shall be punished as a court-martial may direct.

Based on this article is the familiar charge of conduct unbecoming an officer and a gentlemen. *Naval Courts and Boards* gives as examples of violation of this charge the following:

> Knowingly making a false official statement; dishonorable neglect to pay debts; opening and reading another's letters; giving a check on a bank where there were no funds to meet it, and without intending that there should be; using in-

> sulting or defamatory language to another officer in his presence, or about him to other military persons; being grossly drunk and conspicuously disorderly in a public place; public association with notorious prostitutes; failing without a good cause to support his family.

Also based on article 22(a) is the familiar charge of conduct to the prejudice of good order and discipline. *Naval Courts and Boards* cites as violations of this charge the following instances as applied to officers:

> Disobedience of standing orders, or of the orders of an officer when the offense is not chargeable under a specific article; allowing a man to go on duty knowing him to be drunk; rendering himself unfit for duty by excessive use of intoxicants or drugs.

Fraudulent enlistment is covered in article 22(b) which follows:

> Fraudulent enlistment, and the receipt of any pay or allowance thereunder, is hereby declared an offense against naval discipline and made punishable by general court-martial, under this article.

This article is concerned first with fraudulent enlistment, which involves willful and deliberate concealment of a fact which, if known to the recruiting officer, would result in the applicant's rejection; and second, with receipt of any pay allowances as a result of such enlistment. When an individual enlists, knowing he is without a discharge from another enlistment in the Navy or Marine Corps, by that fact alone he may be considered as violating this regulation. However, an individual who has never been in the Navy or Marine Corps, or who has been discharged, but who nevertheless concealed from the recruiting officer information which would have caused his rejection, may be considered as having violated this regulation when he receives pay allowance as a result of such enlistment.

Naval personnel are required to maintain the same high standard of conduct ashore as afloat. There is, of course, no question of jurisdiction at sea since the ship carries her national laws with her. Article 23, which keeps naval personnel under moral restraint ashore, reads:

> All offenses committed by persons belonging to the Navy while on shore shall be punished in the same manner as if they had been committed at sea.

Article 24 definitely limits a commanding officer of a vessel in the punishment he may inflict upon a commissioned or warrant officer. Also enumerated in this article are the punishments a commanding officer may award an enlisted man. It would be well for the officer candidate not only to have a thorough knowledge of this article, but also article 30 (punishments a summary court-martial may award), article 35 (certain general court-martial punishments), and article 64(b) (punishments a deck court may award).

Article 24 follows:

> No commander of a vessel shall inflict upon a commissioned or warrant officer any other punishment than private reprimand, suspension from duty, arrest, or confinement, and such suspension, arrest, or confinement shall not continue longer than 10 days, unless a further period is necessary to bring the offender to trial by a court-martial; nor shall he inflict, or cause to be inflicted, upon any petty officer, or person of inferior rating, or marine, for a single offense, or at any one time, any other than one of the following punishments, namely:
>
> (1) Reduction of any rating established by himself.
> (2) Confinement not exceeding 10 days, unless further confinement be necessary, in the case of a prisoner to be tried by court-martial.
> (3) Solitary confinement, on bread and water, not exceeding 5 days.
> (4) Solitary confinement not exceeding 7 days.
> (5) Deprivation of liberty on shore.
> (6) Extra duties.
>
> No other punishment shall be permitted on board of vessels belonging to the Navy, except by sentence of a court-martial. All punishments inflicted by the commander, or by his order, except reprimands, shall be fully entered upon the ship's log.

Article 49 reads:

> In no case shall punishment by flogging, or by branding, marking, or tatooing on the body be adjudged by any court-martial or be inflicted upon any person in the Navy. The use of irons, single or double, is abolished, except for the purpose of safe custody or when part of a sentence imposed by a general court-martial.

Flogging, the most notorious of the punishments mentioned in article 49, was abolished in our Navy about the middle of the last century. Strange as it may seem, most of the sailors were strongly in favor of this punishment, feeling that without drastic chastisement the good men would have to do the work of the shirkers. All navies since early Christian times had used the system of flogging as a corrective measure with their enlisted personnel.

It should be noted at this point that articles 1 to 23 inclusive deal, in the main, with offenses and duties; articles 24 to 70 deal primarily with naval courts.

It is well to remember that these 70 articles—a stern code born of necessity—are the result of centuries of experience and experiment, tested and approved by men of the ranks as well as by outstanding heroes of the sea. It is the seagoing personnel who understand all too well the value and purpose of discipline, the urgent need for rules and regulations. Wars are not won by freelancers, though they may be prolonged by them. In its ultimate refinement, discipline means victory. Discipline and cooperation are a part of the great tradition of the Navy, and it is a privilege to preserve and perpetuate these traditions of the past. It is easy to understand why a man in the Navy breathes freer and walks with a firmer step when he recalls that he too is obeying the laws that Rodney, Nelson, and Jones obeyed; that he is under the same discipline that Preble, Decatur, Farragut, and a host of other patriots honored and made illustrious. As one writer has stated: "It ought to give any young man entering the Naval Service a certain thrill of elation that he became the heir of a long and glorious tradition, and that, studying the 'Articles' controlling that Service, he is familiarizing himself with regulations, some of which, couched in almost exactly the same words, were obeyed by John Paul Jones and were read to the ship's company of the *Bonhomme Richard*."

CHAPTER 7

NAVY REGULATIONS AND CUSTOMS—Part II

INTRODUCTION

Background

In the preceding chapter on naval regulations and customs, the background and history of the present-day regulations were discussed. It was pointed out that tradition, custom, and usage established the basic laws of the Navy. The regulations, it was noted, were compiled throughout the years. They are based on the accumulated knowledge of generations of naval officers and incorporate the basic lessons of experience. Each article has a history behind it and has been drawn up and recorded to prevent the repetition of an error. It was also noted that *Navy Regulations* deals with questions of principle and that the details of methods for applying these principles are discussed in the manuals of the various bureaus and in other naval publications.

Special emphasis was given to the Articles for the Government of the Navy which contain the penal code and are frequently referred to as "Rocks and Shoals." It was shown that the Rules of 1775 provided the foundation for the Articles and that the discipline of the Navy today rests upon the basic provisions contained therein. The remaining chapters which were referred to briefly are the subject of this chapter.

Some of the regulations mentioned may sound familiar since they have been treated in varying aspects in preceding chapters.

Importance

It is of utmost importance for an officer to be familiar with regulations. His obligation in this matter is clearly stated in article 1209:

> 1209. *Duties Relative to Laws, Regulations, and Orders.*
>
> Every officer in the naval service shall acquaint himself with, obey, and, so far as his authority extends, enforce the laws, regulations, and orders relating to the Naval Establishment. In the absence of instructions he shall act in accordance with the public interest and in conformity with the customs of the service.

The Articles for the Government of the Navy are read once a month to the enlisted men aboard ship, but it is also a wise practice for the officers to reread frequently the chapters that especially concern them. Not only will their task, but also that of their superior officers, be made easier by the knowledge gained. No single professional book is as valuable to the inexperienced officer as *Navy Regulations.*

Summary of Contents

A brief survey of the general subject matter as shown in the table of contents of *Navy Regulations* shows the type of matter now covered in that volume. Following the Articles for the Government of the Navy is Chapter 1 which is titled "The Naval Establishment." Subsequent chapters deal with the Chief of Naval Operations, the General Board, and bureaus and offices. A full chapter is devoted to the duties and responsibilities of the commanding officer and another to those of the executive officer. Heads of departments are the subject of Chapter 9, and Chapter 10 deals with watch and division officers. Included among the other topics covered are: administration of discipline; classified matter; official correspondence; quarters and messes; supply and disbursing; and honors and ceremonies.

Obviously no more than a brief introduction to the contents of *Navy Regulations* can be given here. One of the best methods of becoming familiar with the entire book is to enroll in the correspondence course entitled "Navy Regulations," conducted by the Bureau of Naval Personnel.

Any officer reporting aboard ship, regardless of whether he is the commanding officer, executive officer, head of a department, or watch and division officer, can find in *Navy Regulations* not only a general description of his duties and responsibilities but much other invaluable information.

SOME COMMON BREACHES OF REGULATIONS

Furthering Public Order

It is sometimes forgotten that naval officers are not relieved from their military obligations and responsibilities when ashore (see article 23). An officer's responsibility in furthering public order and welfare is set forth in *Navy Regulations.* Officers traveling on trains or moving about in other public places have on occasion totally ignored disorderly conduct and other offenses committed by enlisted men, thus bringing discredit to themselves, the men, and the Navy. Lack of initiative in this respect is an attempt to avoid one's duty. (For the preservation of good order, petty officers are also always on duty and are vested with the necessary authority to report and arrest offenders. This authority attaches to them while ashore on liberty.) The following articles state the action to be taken:

> 1332. *Authority and Responsibility of a Senior Officer Under Certain Circumstances.*
>
> 1. In the event of a riot or quarrel between persons in the naval service or in other circumstances not provided for in these regulations in which persons in the naval service are involved and the exercise of naval authority is necessary, the senior officer in the naval service at the scene shall assume command and take the action necessary, until relieved of this responsibility by competent authority, and all persons in the naval service in the vicinity shall render prompt assistance and obedience to the officer thus engaged in the restoration of order.
>
> 2. Should there be no commissioned officer at the scene, the senior warrant, petty, or noncommissioned officer present shall assume command.
>
> 3. The person who assumes command under the above circumstances shall have the authority to arrest any person in the naval service if necessary.

Article 1316 further states:

> 1316. *Exercise of Authority.*
>
> 1. All persons in the naval service, on active service, on furlough, on the retired list with pay, and transferred members of the Fleet Reserve and the Fleet Marine Corps Reserve, are at all times subject to naval authority. While on active service they may, if not on leave of absence (except as noted below), on the sick list, under arrest, suspended from duty, in confinement, or otherwise incapable of discharging their duties, exercise authority over all persons who are subordinate to them.
>
> 2. A person in the naval service, although on leave, may exercise authority:
>
> (a) When in a naval vessel or aircraft and placed on duty by the commanding officer.
>
> (b) When in a vessel or aircraft of the armed services of the United States, other than a naval vessel or aircraft, as the commanding officer of naval personnel embarked, or when placed on duty by such officer.
>
> (c) When senior officer at the scene of a riot or other emergency, or when placed on duty by such officer.

At this point article 1216 is also pertinent:

> 1216. *Obligation to Report Offenses.*
>
> All persons in the naval service shall report to the proper authority all offenses committed by persons in the naval service which may come under their observation.

Bureau of Naval Personnel Circular Letter 74-42, dated 12 May 1942, on the subject of Conduct of Naval Personnel on Public Carriers expands the above and reads:

> There are increasing reports of misbehavior of naval personnel on trains. These reports include intoxication, annoying and disturbing civilian passengers, damaging and defacing railroad equipment, over-running lounge cars on

BAG INSPECTION
Inspection is conducted by petty officer whose gear is, in turn, subject to inspection by higher authority. *Navy Regulations* governs exercise of authority at all levels.

through trains, improper dress or uniform, insubordination and physical attack on train officials, and general obnoxious behavior. In some cases it has been noted that these actions took place in the presence of officers or petty officers who, in place of taking appropriate action, merely ignored the situation. . . . It is directed that immediate necessary action be taken to correct the conditions noted above and that such action include: Warning all naval personnel that failure to take necessary and prompt action to correct any misbehavior of naval personnel on trains or elsewhere will result in disciplinary measures. This applies particularly to officers and petty officers.

Duty Orders

An officer's application for orders to duty, or for revocation or modification of orders, must be made according to *Navy Regulations.* It would be quite improper, for example, for an officer to correspond directly with the Detail Office for a change of orders. Both the manner of making such applications and the authority to whom they should be addressed are clearly stated, and any deviation therefrom is contrary to *Navy Regulations.*

> *1343. Changes in Details to Duty.*
>
> No officer, except the senior officer present, shall change the detail of a person assigned by a superior to a specific duty without the permission of that superior. The senior officer present shall not change the detail of any person without good and sufficient reason and shall report all changes and the reasons for them to the superior without delay.

Officers sometimes apply in a proper manner for revocation or modification of orders to proceed and, although able to travel, they then delay without authority, awaiting action on their request. This is forbidden. *Navy Regulations,* article 1229, paragraph 3, is specific in regard to such delays.

> *1229. Action Upon Receipt of Orders.*
>
> 3. An application for the revocation or modification of orders will not justify any delay in their execution, if the officer ordered is able to travel.

When officers are reporting for duty or visiting a command officially, they are required to report to the commanding officer as directed in the following articles:

> *1230. Action Upon Reporting for Duty and From Leave.*
>
> 1. When a person in the naval service reports in accordance with written orders, he shall present such orders to the officer to whom he reports.
> 2. Officers shall endorse upon the orders of those who report to them the time, date, and place of reporting.
> 3. Every individual to whom leave is granted shall promptly report his return therefrom to the officer who granted it. The commanding officer shall make such report as may be required by the Chief of Naval Personnel or the Commandant of the Marine Corps.
>
> *1231. Visits to a Command.*
>
> An officer visiting a command in the performance of any official duty connected therewith shall report to the commanding officer, and, when the duty is of such nature that the presence of the visiting officer should be known by other commanders in the area, appropriate reports shall be made to them by him.

Exchanging Duty

Inexperienced officers sometimes get into difficulties because they absent themselves from duty or exchange duty without permission from the proper authority. Article 1213 is clear on this point:

> *1213. Exchange of Duty.*
>
> No person in the naval service shall exchange an assigned duty with another without permission from his commanding officer or other superior.

Communications to Congress

Navy Regulations is very definite on the question of officers combining for the purpose of influencing legislation, remonstrating against orders, or complaining about details of duty. The following articles definitely indicate officers' responsibility regarding communications to Congress:

> *1247. Combinations for Certain Purposes Forbidden.*
>
> Combinations of persons in the naval service for the purpose of influencing legislation, remonstrating against orders or details to duty, complaining of particulars of duty, or procuring preferences are forbidden.
>
> *1248. Communications to the Congress.*
>
> All petitions, remonstrances, memorials, and communications from any person or persons in the naval service, whether on the active or retired list, addressed to the Congress, or to either House thereof, or to any committee thereof, on any subject of legislation relating to the Naval Establishment, whether pending, proposed, or suggested, shall be forwarded through, or as authorized by, the Secretary of the Navy.

Temperate Language in Reports

School is not the only place for passing tests. Whether one likes it or not, while in the Navy he is subject to periodic fitness reports. (An enlisted man also receives marks periodically and these are entered in his Service Record.) His conduct is under constant surveillance by his commanding officer. The Navy Department, however, is extremely fair, for if any part of an officer's fitness report is unsatisfactory, the entire report is referred to that officer and he is requested to make a statement regarding the unsatisfactory portion. It is assumed that the commanding officer in his report makes an objective judgment. It is incumbent upon the officer reported on to reply in kind. Some officers, at times, however, have unwisely couched their remarks in intemperate language and used the occasion as an opportunity to make counter charges against the officer who made out the report. This irregular practice is contrary to *Navy Regulations*. Others, in making reports or complaints, have wandered from known facts and drawn on their imagination for data. This, too, should be avoided.

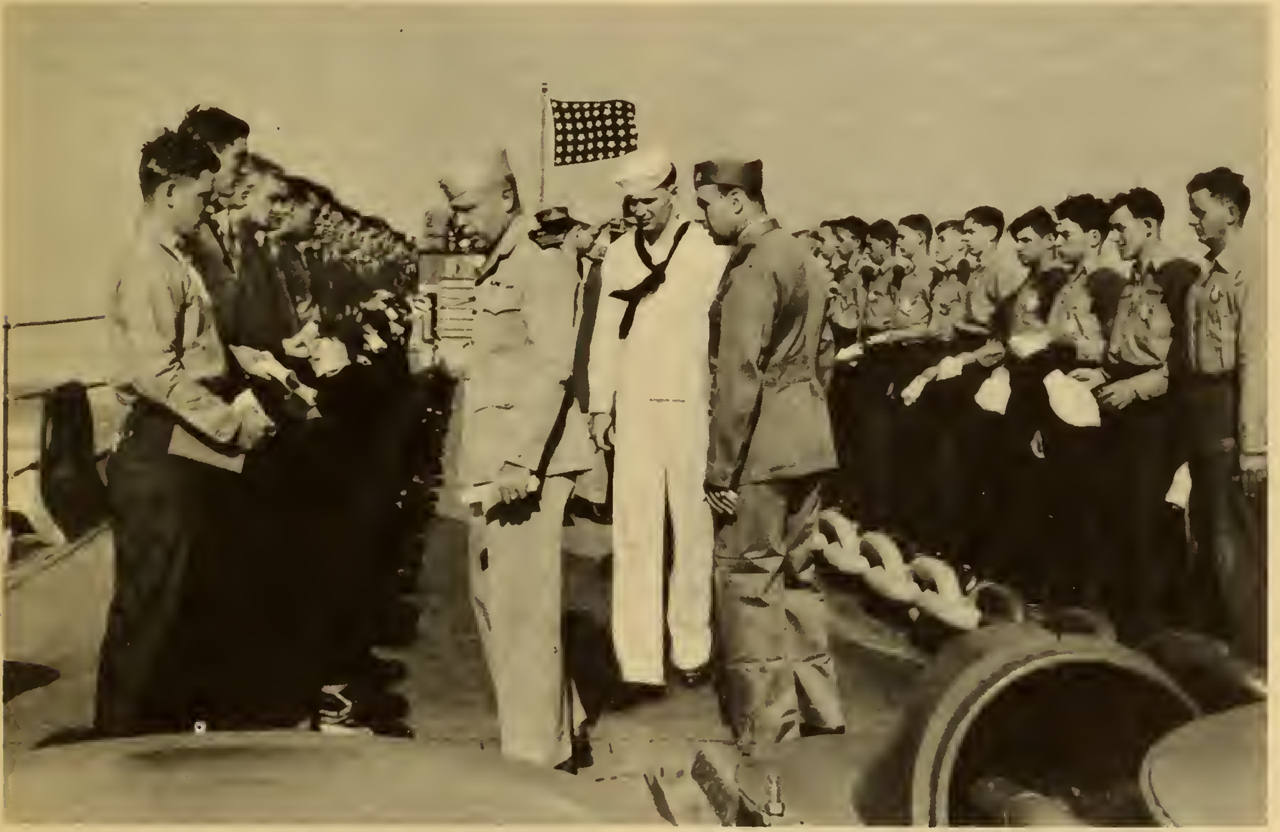
Article 1405 (paragraphs 2 and 3), states specifically:

> *1405. Accusations, Replies, and Counter Charges.*
>
> 2. Reports or complaints, and statements submitted in reply thereto or in explanation thereof, shall be couched in temperate language and shall be confined to pertinent facts. Opinions shall not be expressed nor the motives of others impugned.
>
> 3. Persons in the naval service to whom reports or complaints are submitted for statement shall not reply by making counter charges.

Language Concerning Superiors

Officers should always remember that it is contrary to *Navy Regulations* to use language which may tend to diminish the confidence or respect due to a superior. Furthermore, an officer who hears such language has certain obligations. This subject is clearly explained in the following article:

> *1212. Language Reflecting Upon a Superior.*
>
> No person in the naval service shall use language which may tend to diminish the confidence in or respect due to his superior officer. It is the duty of every person in the naval service who hears such language to endeavor to check it and to report the same immediately to his superior.



NAVY LIFE IS A LIFE OF ORDER

Regulor personnel inspections required by *Novy Regulotions* insure thot uniforms are kept in proper condition. The white hats are being presented to show thot eoch is stencilled with the owner's name.

Saluting

Young officers frequently become careless about saluting, little realizing that laxity in this respect creates a most unfavorable impression and reflects poorly on the individual guilty of this breach of naval etiquette. The rendering of salutes is considered one of the fundamental steps in discipline. Failure to carry out the requirements stated in *Navy Regulations* in this respect leads to other dereliction, is nonmilitary, and undermines the morale of the Service. Article 2110 reads:

> *2110. Exchange of Hand Salute.*
>
> 1. The hand salute is the long-established form of greeting and recognition exchanged between persons in the armed services. All persons in the naval service shall be alert to render or return the salute as prescribed in these regulations.
>
> 2. The salute by persons in the naval service shall be rendered and returned with the right hand, when practicable; except that, with arms in hand, the salute appropriate thereto shall be rendered or returned.
>
> 3. Juniors shall salute first. All salutes received when in uniform and covered shall be returned; at other times salutes received shall be appropriately acknowledged. Persons uncovered shall not salute, except when failure to do so would cause embarrassment or misunderstanding.
>
> 4. Civilians may be saluted by persons in uniform when appropriate, but the uniform hat or cap shall not be raised as a form of salutation.
>
> 5. A person in the naval service not in uniform shall, in rendering salutes or exchanging greetings, comply with the rules and customs established for a civilian; except that when saluting another person in the armed services, the hand salute shall be used.

Officers sometimes fail to render the proper salute when coming aboard ship. The correct procedure is described in article 2108.

> *2108. Salutes to the National Ensign.*
>
> 1. Each person in the naval service, upon coming on board a ship of the Navy, shall salute the national ensign if it is flying. He shall stop on reaching the upper platform of the accommodation ladder, or the shipboard end of the bow, face the national ensign, and render the salute, after which he shall salute the officer of the deck. On leaving the ship, he shall render the salutes in inverse order. The officer of the deck shall return both salutes in each case.
>
> 2. When passed by or passing the national ensign being carried, uncased, in a military formation, all persons in the naval service shall salute. Persons in vehicles or boats shall follow the procedure prescribed for such persons during colors.
>
> 3. The salutes prescribed in this article shall also be rendered to foreign national ensigns and aboard foreign men-of-war.

Lending Money; Engaging in Trade

Lending of money by naval personnel for profit or benefit is generally forbidden in the Naval Service. Engaging in trade is also undesirable aboard ship or on station. The following article sets forth the conditions governing such activities.

> *1260. Lending Money and Engaging in a Trade or Business.*
>
> 1. No person in the naval service, on active service, shall, for profit or benefit of any kind, lend money to any other person in the armed services, except by permission of his commanding officer; nor, having made a loan to another person in the armed services, shall he take or receive, in payment therefor, then or later, directly or indirectly, without the approval of the commanding officer, a sum of money, or any other thing or service, of a greater amount or value than the sum of money loaned.
>
> 2. Unless authorized by his commanding officer or higher authority, no person in the naval service on active service, either for himself or as an agent for another, shall engage in trade or business on board any ship of the Navy or within any naval station or introduce any article for purposes of trade on board any ship of the Navy or within any naval station.

Navy Regulations does not permit naval personnel on active service (nor civilian employees) to receive gratuities from contractors. Violations of this regulation have brought serious results.

> *1257. Gratuities from Contractors.*
>
> Except as authorized by the Secretary of the Navy, no person in the naval service on active service and no civilian employee of the Naval Establishment shall take or receive, directly or indirectly, any emolument or gratuity from any contractor or other person engaged in furnishing supplies to the United States for the use of the

Naval Establishment or act as an agent or attorney for such person.

Other Financial Matters

It is well to remember that an officer's actions reflect either favorably or unfavorably upon the Navy. There are instances when officers have brought discredit not only upon themselves, but upon the Service as well, by failing to discharge their just financial obligations. The article quoted below definitely points out an officer's duty in this respect.

> *1256. Incurring Debts.*
>
> 2. No person in the Naval Establishment shall time or place contract debts without a reasonable expectation of being able to discharge them.
>
> 2. Persons who fail to discharge their just indebtedness by every reasonable means shall be held to have brought discredit upon the naval service.

Many officers have been confronted with the awkward problem of deciding what to do when men try to borrow money from them. While they must refuse to lend money to enlisted personnel regardless of the situation, they should, if the need is urgent (perhaps emergency leave because of death in the family), make every effort to get the needed sum in a legitimate way (welfare fund, Navy Relief).

Another problem arises when men ask officers who are not so authorized to accept money for safekeeping. The officer must refuse. Such action is not sanctioned by *Navy Regulations*, and officers who err may have reason to regret it. Naturally, no officer under any circumstances borrows money from enlisted personnel. Pecuniary dealings between officers and enlisted men are covered in the following article:

> *1259. Pecuniary Dealings With Enlisted Personnel.*
>
> No officer shall borrow money or accept deposits from, or have any pecuniary dealings with an enlisted person, except as may be required in the performance of his duty.

Soliciting of contributions for gifts to superiors is expressly forbidden in the following article:

> *1258. Making of Gifts or Presents.*
>
> 1. No person in the Naval Establishment shall at any time solicit contributions from other persons in the naval service or from other officers, clerks, or employees in the Government service for a gift or present to persons in superior official positions; nor shall any persons in such superior official positions receive any gift or present offered or presented them as a contribution from persons in Government employ (including persons in the naval service) receiving a less rate of pay than themselves, nor shall any of said persons make any donation as a gift or present to any such official superiors.
>
> 2. No person in the Naval Establishment shall solicit subscriptions for the purpose of making a gift to a member of the immediate family of a person in a superior official position.

A CLEAN SHIP IS A HEALTHY SHIP
Midshipmen on summer cruise oboord USS *Wisconsin* ore receiving their first lesson in holystoning o deck.

Alcoholic Liquors

Navy Regulations specifically controls the use of alcoholic liquors. The presence of such liquors for beverage purposes aboard naval ships or aircraft is forbidden by the following article:

> *1269. Alcoholic Liquors.*
>
> 1. The introduction, possession, or use of alcoholic liquors for beverage purposes on board any ship, craft, or aircraft of the Navy is prohibited: *Provided*, That the Secretary of the Navy may authorize, at his discretion, the transportation of alcoholic liquors as cargo in ships, craft, or aircraft of the Navy for use of Government activities ashore outside the continental limits of the United States.
>
> 2. The introduction, possession, or use of alcoholic liquors for beverage purposes or for sale

is prohibited within naval shipyards, marine barracks, naval stations, and other places ashore under the jurisdiction of the Navy Department which are located in States, Territories, or insular possessions in which the possession or use of such liquors for beverage purposes is not permitted by law. Subject to the foregoing, the introduction, possession, and use of alcoholic liquors for beverage purposes are authorized within naval stations and other places ashore under naval jurisdiction, to the extent and in such manner as the Secretary of the Navy may prescribe.

Article 0625, paragraph 4, concerns the use of intoxicants while on patrol duty:

> *0625. Shore Patrol.*
>
> 4. No officer or man who is a member of the shore patrol shall, while on watch, on post, or at other times prescribed by the senior patrol officer, partake of or indulge in any form of intoxicating liquor or other form of intoxicant or narcotic. The senior patrol officer shall see that the provisions of this paragraph are strictly observed, and shall promptly report to the senior officer present, in writing, all violations of it that may come to his notice. All officers and men of the patrol shall report to the senior patrol officer all violations of the provisions of this paragraph on the part of those under them.

Security of Information; Disclosure to Public

The importance of security of information is frequently overlooked in peacetime. *Navy Regulations* stresses this point in the following article:

> *1252. Disclosure and Publication of Information.*
>
> 1. No person in the Naval Establishment shall convey or disclose by oral or written communication, publication, or other means, except as may be required by his official duties, any information whatever concerning the Naval or other Military Establishment or forces, or any person, thing, plan, or measure pertaining thereto, when such information might be of possible assistance to a foreign power; or, except by proper naval authority, any information contained in the official records of the Government or otherwise acquired which, for reasons of public policy, should not be disclosed to persons not of the Naval or other Military Establishments; nor shall any person in the naval service make any public speech or permit publication of any article written by or for him which is prejudicial to the interests of the United States.
>
> 2. No person in the Naval Establishment shall, other than in the discharge of his official duties, disclose any information whatever, whether classified or nonclassified, or whether obtained from official records or within the knowledge of the relator, which might aid or be of assistance in the prosecution or support of any claim against the United States.
>
> 3. Persons in the naval service desiring to publish articles on professional, political, or international subjects in accordance with the provisions of this regulation shall cause their signatures to appear on such articles, together with a statement to the effect that the opinions or assertions contained therein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large. Immediately upon the acceptance of such articles for publication, the writer shall forward a complete copy of such articles to the Secretary of the Navy for the files of the Navy Department.
>
> 4. No person in the naval service shall act in time of war as correspondent of a news service or other periodical, or as a radio news commentator or analyst, unless assigned to duty in connection with the public relations activities of the Naval Establishment, or specifically authorized by the Secretary of the Navy. In time of peace, a person in the naval service may act in such capacity, but the Secretary of the Navy shall be immediately informed. Except as authorized by the Secretary of the Navy, no person assigned to duty in connection with the public relations activities of the Naval Establishment shall receive any compensation for acting as such correspondent, commentator, or analyst.
>
> 5. Subject to the requirements and restrictions of this article, persons in the naval service are at liberty to publish articles without further permission from higher authority.

The failure to comply with security regulations in regard to classified matter is regarded as a serious offense. Article 1510 states:

> *1510. Responsibility for Unauthorized Disclosure.*
>
> Each person to whom classified matter is, for any purpose and from any source, entrusted or made known, or who has knowledge of such matter, shall protect it against loss, compromise, or unauthorized disclosure; and he shall be responsible for any act or failure on his part which may

in any way contribute to its loss, compromise, or unauthorized disclosure.

It is also important to note that an officer is not, merely by reason of his commission, authorized to see or have access to classified material. Article 1509, paragraph 1, states this clearly.

1509. Dissemination of Classified Matter.

1. Classified matter shall be distributed or divulged only to the extent required by the circumstances, in accordance with its classification grade. No person is entitled to knowledge or possession of classified matter solely by virtue of his rank, office, or position.

IMPORTANT REGULATIONS FOR THE NEW OFFICER

Miscellaneous Articles

The following articles of *Navy Regulations* contain information of a miscellaneous nature. Most of them are concerned with matters directly connected with the officer's performance of duty and his daily life aboard ship or on a naval station.

Types of Orders

There are three general types of orders an officer may receive and *Navy Regulations* clearly explains the meaning of each.

1229. Action Upon Receipt of Orders.

1. An order from competent authority to an officer requiring such officer to report for duty at a place, or to proceed to any point and report for duty, but fixing no date and not expressing haste, shall be obeyed by reporting within 4 days, exclusive of travel time, after its receipt for execution. If the order read "without delay," the officer shall report within 48 hours, exclusive of travel time, after its receipt for execution; and if "immediately," within 12 hours, exclusive of travel time, after its receipt for execution. Officers shall endorse on their orders the date and hour of their receipt for execution. Any delay in carrying out orders granted by competent authority is in addition to the time allowed by this article.

2. The time allowed by this article can be taken only once, and, if taken, must be taken between the time of detachment from the officer's original station and the time of reporting for the first time in obedience to the orders.

In connection with detachment from one ship or station and transfer to another, the following is the interpretation by the Bureau of Naval Personnel of phraseology used in such orders:

a. When the term "hereby detached" is used, it is intended that, if possible, the commanding officer detach the officer concerned within 24 hours after the orders are received on board.

b. When the term "detached on or about" is used, it is intended that the commanding officer will have a discretionary period of 10 days on either side of the given date in which the officer to whom the orders are addressed may be detached.

c. When the term "detached in time to proceed and report" on a certain date is used, the latest or limiting date of detachment, if the ship's location permits, will be 4 days plus the required travel time in advance of the specified reporting date.

d. When the term "detached when directed" is used, the officer should be detached within 10 days of receipt of orders.

e. When the term "detached when relieved" is used, it is not necessary to detach the officer until his relief has been properly instructed in his new duties, and the commanding officer feels that the relief is competent to relieve the officer being detached.

f. When the term "upon the reporting of ——— ——— detached" is used, the officer should be detached within 24 hours of the reporting of ———.

Conflicting Orders

An officer is sometimes faced with contradicting or conflicting orders from superiors and is uncertain as to the proper step to take. This problem is covered in paragraph 2 of article 1320.

1320. Contradictory and Conflicting Orders.

2. If an officer receives an order which annuls, suspends, or modifies one received from another superior, or one contrary to instructions or orders from the Secretary of the Navy, he shall exhibit his first orders, unless he has been instructed not

to do so, and represent the facts in writing to the superior from whom the last order was received. If, after such representation, the latter shall insist upon the execution of his order, it shall be obeyed, and the officer receiving and executing it shall report the circumstances to the superior from whom he received the original order.

Leave and Liberty

The difference between leave and liberty is set forth clearly in two articles of *Navy Regulations.* Article 1283 should be studied carefully in order that there may be no misunderstanding as to the amount of leave accruing. In connection with article 1284, the last paragraph especially should be borne in mind when on liberty. Note also the time limit on liberty and the fact that it is not chargeable to leave.

1283. Leave.

1. "Leave" is the authorized absence of an individual from a place of duty, chargeable against such individual in accordance with the Armed Forces Leave Act of 1946, as amended.

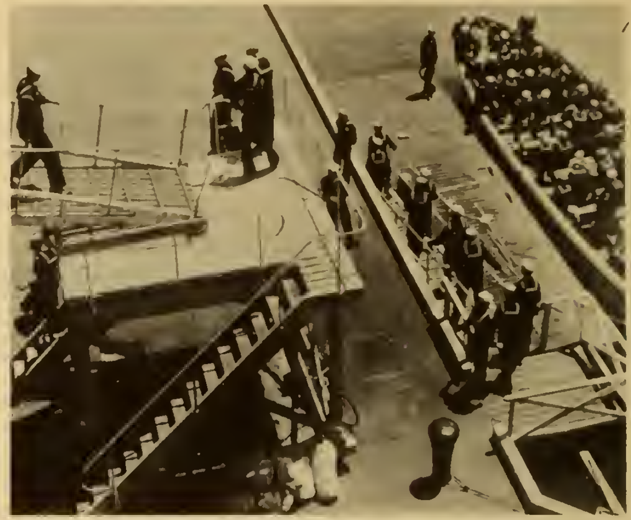
2. Each person in the naval service on active service (exclusive of certain periods of temporary active service for training purposes only) shall be entitled to leave at the rate of two and one-half calendar days for each month of active service, excluding periods of absence from duty without leave, absence over leave, and confinement as a result of a sentence of a deck court, or a summary or general court-martial. During such leave except as otherwise provided by law and regulation he shall be entitled to the same pay and allowances he would receive if not on leave, and to any additional or other allowances otherwise authorized or provided by law for persons while on leave.

3. Sick and convalescent leaves are leaves granted to persons while under medical care and treatment and shall be considered to be a part of the period of care and treatment.

4. Insofar as service requirements permit, all persons shall be afforded the opportunity and encouraged to take leave annually as accruing.

1284 Liberty.

1. "Liberty" is authorized absence of an individual from a place of duty, not chargeable as leave.



CONDUCT ASHORE IS GOVERNED BY *NAVY REGULATIONS*
Strict observance of applicable *Navy Regulations* when a crew is on shore liberty is essential, for by their actions, the entire organization is judged.

2. Liberty may be granted at any time for a period up to 48 hours. A 48-hour period may be extended to 72 hours by the commanding officer if the period includes a holiday which is proclaimed by the President or authorized by the Secretary of the Navy. When either the 48- or 72-hour periods expire between the end of regular working hours on one day and the commencement of working hours or the time set for expiration of regular liberty on the next day, these periods may be further extended to such commencement of working hours or expiration of liberty.

3. Liberty shall not be used to extend leave periods.

4. Unless otherwise authorized by the commanding officer in specific cases, all persons on liberty shall remain in the general vicinity of the command. as prescribed by competent authority.

Start and Termination of Leave

Ignorance of the rules governing leave is never acceptable as an excuse if an officer returns late from leave. The wise officer will know exactly, *before he goes on leave,* when the leave starts and when it is considered officially terminated. An officer on duty abroad, on being granted a month's leave in the United States, will want to know whether such leave starts officially on the day he leaves his ship or station, or whether it is counted from the day he arrives in the United States. An officer who was on duty until noon before starting a seven-day leave from his station will want to know whether the day of departure will count as a day of leave. The same question will arise concerning his return from leave. Leave policy is covered in the *Bureau of Naval Personnel Manual;* it is appropriate here to quote the following articles from that source:

> Article C-6310.
>
> *Leave to Visit United States During Foreign Service.* (1) Personnel on duty on foreign stations shall be subject to the following conditions in computing travel time and leave time in connection with duly authorized leave to visit the United States.
>
> (a) Leave to visit the United States shall commence on the date of departing from the port (or aerial port) of debarkation in the United States for leave destination.
>
> (b) Personnel shall be considered as returned to a duty status upon date of reporting at a United States port (or United States aerial port) of embarkation for return to foreign service.
>
> (c) Travel performed to and from the United States and delays at port shall be in a duty status.
>
> (d) No travel expenses shall be allowed in connection with visits to the United States for leave.
>
> Article C-6313.
>
> *Day of Departure—Day of Return.* (1) Day of departure, whatever the hour, is counted as a day of duty; the day of return is a day of leave; except when such return is made before 0900, in which case it shall not be counted as a day of leave. Notwithstanding the above, in cases of delay en route to count as leave between stations, the day of reporting is counted as a day of duty. These instructions must not be confused with those concerning reporting in obedience to orders which grant delay to count as leave. The individual under orders is not reporting from leave but is reporting for duty after being granted a delay in reporting, therefore he must report before midnight on the reporting date.

Carrying Out Assigned Duty

Officers may not always be assigned to duty for which they have expressed a preference. But even in wartime the Navy Department endeavors to grant individual requests for a particular type of duty. Nevertheless this is not always possible, and the officers' obligation to perform the duty assigned them is the subject of article 1342, quoted here in part.

> *1342. Sea and Shore Duty.*
>
> Officers of the naval service shall perform such duty at sea or on shore as may be assigned to them by the Secretary of the Navy, . . .

Assigning of Quarters

The assigning of officers' quarters afloat is the subject of article 1802. The ship's plans in some cases give the exact location of certain officers' quarters; those not so specified are assigned by the commanding officer. Paragraphs 1 to 4 of this article are:

> *1802. Assignment of Officers' Quarters Afloat.*
>
> 1. All commissioned officers, not in command, above the grade of ensign or second lieutenant, and ensigns or second lieutenants assigned to duty as division officers, shall, insofar as practicable, be wardroom officers and occupy wardroom quarters.
>
> 2. The assignment of officers' quarters on board ship shall be in accordance with the approved plans of the ship as issued by the Bureau of Ships and approved by the Chief of Naval Operations. As appropriate, plans shall show the quarters assigned to the captain, to the executive officer, to the heads of departments, to the air group commander, to aircraft squadron commanders, to the commanding officer of the Marine detachment, to the chaplain, to other wardroom officers, and, if the size and type of the ship warrant, to junior and warrant officers. The plans of ships designed as flagships shall show, in addition, the quarters assigned to the flag officer, the chief of staff, and to the senior officers of the staff.
>
> 3. Rooms and bunk rooms not specifically designated on the plans shall be assigned by the commanding officer who, in making assignments, shall exercise due regard for the relative rank of the officers concerned and the desirability of permanence of quarters assigned to watchkeeping officers.
>
> 4. Each commissioned warrant officer and warrant officer shall have a room when such is available, in accordance with the plans of the ship. When necessary, however, two or more of them shall occupy one room jointly. The rooms need not be assigned in the order of seniority.

Mess Procedures

There are definite rules governing mess procedure, and an officer will find it of value to know these rules before the need arises aboard ship for using them. The rules, all of which are found in *Navy Regulations*, deal with such questions as: Is an officer ever allowed to take his meals in his room? Who presides over the mess? On what basis are seats assigned at the mess table? When should mess bills be paid?

In article 1811, the seating arrangament is carefully set forth. Note, too, that the seat assigned is the one which the officer should always occupy when at meals.

> *1811. Officers' Messes Afloat.*
>
> 1. Officers shall mess in the compartments assigned therefor, and meals shall not be taken in rooms except in case of sickness or when directed by the commanding officer.
>
> 2. Separate messes shall not be formed in the same compartment except in transports when circumstances require.
>
> 3. Officers embarked as passengers shall be assigned to the mess to which they would belong if they were attached to the ship.
>
> 4. The officers of the mess shall be assigned permanent seats at the mess tables alternately, in the order of rank to the right and left of the presiding officer, except that the seat opposite that of the president shall be occupied by the mess caterer.

Article 1812 deals with the president of the officers' mess. He is charged with the preservation of order, and provision is made for another officer to take his place in his absence.

NAVY REGULATIONS IN FORCE HERE, TOO
The officer's wordroom is the subject of several articles in Chapter 18 of Navy Regulations, which deals with quarters and messes.

> *1812. President of Officers' Messes Afloat.*
>
> 1. In all officers' messes afloat the senior line officer of the mess, in command or in succession to command, shall be the mess president. He shall preside, and is charged with the preservation of order. When the mess president is absent, the senior line officer of the mess in succession to command, or, if there be none, the senior officer who is present and attached to the ship for duty, shall act as president.
>
> 2. In those ships where provision is made for separate warrant officers' messes, the senior line officer of the mess shall be the mess president, and in his absence the senior line officer of the mess who is present, if there be one, shall act as president; otherwise the foregoing provisions of this article are applicable.

The duties of the mess treasurer are described briefly in article 1813. Note that the treasurer is elected and that he is not required to serve more than two consecutive months. Each month he must submit a statement of the accounts of the mess.

> *1813. Treasurer of Officers' Messes Afloat.*
>
> 1. Each officers' mess shall elect monthly a mess treasurer who shall have charge of the finances of the mess. All members of a mess who are attached to the ship for duty are eligible to election as mess treasurer and if elected shall so serve, except that officers charged with the custody or disbursement of public funds are not eligible and shall not serve as mess treasurer.
>
> 2. No officer shall be required to serve more than 2 months consecutively as mess treasurer.
>
> 3. The mess treasurer shall keep an account of all receipts and expenditures, from which an abstract of the financial condition of the mess may at any time be ascertained. At the close of each month he shall render to the mess a statement of the accounts of the mess, showing in detail all sums owed to or by the mess and the names of the persons by or to whom owed, his receipts and expenditures, and contracts entered into for future delivery of supplies. The books of the mess shall be produced whenever called for by the commanding officer or the executive officer.
>
> 4. He shall incur no indebtedness which cannot be discharged by the funds appropriated by the mess and shall, unless circumstances beyond his control prevent, see that all bills are paid be-

fore leaving port. Should any bills remain so unpaid, he shall report, without delay, the number and amount of such bills to the commanding officer.

5. The mess treasurer's accounts shall be audited monthly by a board composed of three officers designated by the commanding officer. The auditing board shall, after examining the accounts and satisfying itself as to their condition, certify them by signature with such comment as may be desirable, and shall then submit them to the commanding officer, via the executive officer, by the 10th of the month. If the condition of the mess, as shown by the mess treasurer's accounts or the report of the board, be unsatisfactory in any respect, the commanding officer shall take appropriate action. The board appointed to audit the accounts shall take an inventory of the cash and stock of the mess concurrently and include a statement thereof in its report to the commanding officer.

6. No stores shall be procured by a mess under an agreement whereby the supplier of such stores permits payment upon consumption.

7. Neither the steward nor any other person shall, without written authority from the mess treasurer, be permitted to incur indebtedness in the name of the mess.

In some cases there is, in addition to the mess treasurer, a mess caterer who is appointed by the commanding officer. This may be assigned as a permanent duty if the mess is a very large one, otherwise he may serve four months consecutively. Article 1814 gives an understanding of the duties of the mess caterer.

1814. Caterer of Officers' Messes Afloat.

1. Except in those cases where the mess treasurer performs the functions of both treasurer and caterer, the commanding officer shall appoint from the officers of each mess a mess caterer.

2. No officer shall be required to serve as mess caterer more than 4 months consecutively, unless he shall, in connection with a very large mess, have been assigned such as his permanent duty.

3. The mess caterer shall approve all menus for the mess.

4. He shall be responsible for the efficient operation of the mess, shall supervise the procurement, storage, and issue of all provisions and supplies for the mess, obtaining funds therefor from, and accounting for them to, the mess treasurer, and shall have charge of the Government property in use by the mess.

5. He shall detail steward's mates for duty within the mess, subject, in the case of permanent details, to confirmation by the executive officer.

6. He shall supervise the preparation and service of food in the mess.

7. He shall supervise the cleaning of equipment and spaces assigned to the mess and to its members.

Mess bills are paid in advance. However, if absent from the ship for certain specified periods, the officer is entitled to a rebate for the period of absence. Article 1815 sets forth the conditions under which an officer may receive a rebate on his mess bill.

1815. Payment of Mess Bills Afloat.

1. Every officer attached to a ship shall belong to one of the officers' messes in that ship and shall pay monthly, in advance, the full amount of the mess bill to the mess treasurer; and no officer shall be excused from such payment except as provided in the succeeding paragraphs of this article.

2. An officer ordered on detached duty or sent to a hospital shall be entitled to a rebate of the full amount of his mess bill for the period of his absence. An officer ordered temporarily to duty away from the ship to which he is attached, so that he does not avail himself of the privileges of the mess during such absence is "ordered on detached duty" within the meaning of this paragraph, even though such duty shall be "in addition to his present duty."

3. An officer granted leave of absence for more than 6 days, including travel time, shall be entitled to a rebate of the amount of his mess bill for the period of his actual absence exceeding 6 days but no rebate shall be allowed for the first 6 days of such absence.

4. Officers and others in a transient or temporary duty status, who are not entitled to reimbursement for meals, shall be charged at a rate prescribed by the commanding officer. If, however, they so desire, and subject to the approval of the commanding officer, officers in such status may become members of the mess.

"Cigar messes" may be formed aboard ship but membership is not compulsory. Article 1816 states:

1816. Cigar Mess Afloat.

Wardroom officers may form a "cigar mess" of which all commissioned and warrant officers attached to or serving in the ship may become members upon payment of a mess entrance fee; but no officer shall be required to become a member thereof. A cigar mess shall be governed by the applicable provisions of article 1813.

Quality of Food

It is important to know *Regulations* when objections are raised by the crew in respect to the quality of the provisions issued to them. This problem is covered in article 1982.

1982. Quality and Quantity of Rations.

Each meal served in the general mess shall be sampled by an officer detailed by the commanding officer for that purpose. Should this officer find the quality or quantity of the food unsatisfactory, or should any member of the mess object to the quality or quantity of the food, the commanding officer shall be immediately notified and he shall take appropriate action.

Morning and Evening Colors

The following regulations with respect to morning and evening colors should be noted:

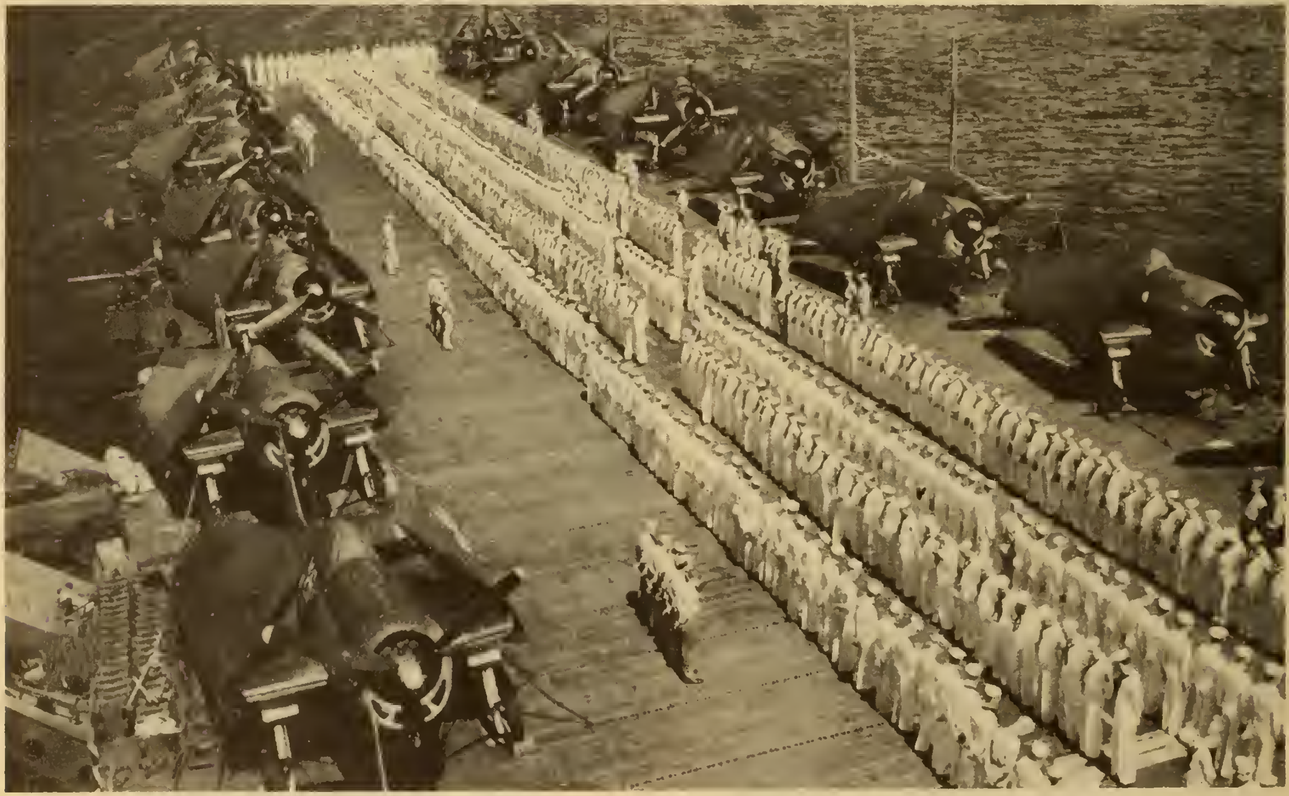
2107. Morning and Evening Colors.

1. The ceremonial hoisting and lowering of the national ensign at 0800 and sunset at a naval command ashore or aboard a ship of the Navy not under way shall be known as morning colors and evening colors, respectively, and shall be carried out as prescribed in this article.

2. The guard of the day and the band shall be paraded in the vicinity of the point of hoist of the ensign.

3. "Attention" shall be sounded, followed by the playing of the national anthem by the band.

4. At morning colors, the ensign shall be started up at the beginning of the music and hoisted smartly to the peak or truck. At evening



INSPECTION ABOARD A CARRIER
The carrier's long flight deck makes a striking background for the gleaming white uniforms of the men lined up for captain's inspection.

colors, the ensign shall be started from the peak or truck at the beginning of the music and the lowering so regulated as to be completed at the last note.

5. At the completion of the music, "Carry On" shall be sounded.

6. In the absence of a band, "To the Colors" shall be played by the bugle at morning colors, and "Retreat" at evening colors, and the salute shall be rendered as prescribed for the national anthem.

7. In the absence of music, "Attention" and "Carry On" shall be the signals for rendering and terminating the salute.

8. During colors, a boat under way within sight or hearing of the ceremony shall lie to, or shall proceed at the slowest safe speed. The boat officer, or in his absence the coxswain, shall stand and salute except when dangerous to do so. Other persons in the boat shall remain seated or standing and shall not salute.

9. During colors, vehicles within sight or hear- of the ceremony shall be stopped. Persons in such vehicles shall remain seated and shall not salute.

10. After morning colors, if foreign warships are present, the national anthem of each nation so represented shall be played in the order in which a gun salute would be fired to, or exchanged with, the senior official or officer present of each such nation; provided that, when in a foreign port, the national anthem of the port shall be played immediately after morning colors, followed by the national anthems of other foreign nations represented.

Honors to National Anthems

According to *Navy Regulations*, the following procedure should be observed by naval personnel during the playing of national anthems:

2106. Procedure During Playing of National Anthems.

1. Whenever the national anthem of the United States is played, persons in the naval service shall stand at attention and face the music except at colors, when they shall face the ensign. When covered they shall come to the salute at the first note of the anthem, and shall remain at the salute until the last note of the anthem. Persons in ranks shall come to the salute together, by command. Persons in vehicles or in boats shall follow the procedure prescribed for such persons during colors.

FIELD DAY ABOARD SHIP
Custom, tradition, and regulations combine to maintain healthful conditions aboard ship. Weekly airing of bedding is in progress in this illustration.

2. The same marks of respect prescribed during the playing of the national anthem of the United States shall be shown during the playing of a foreign national anthem.

Observing the Sabbath

The manner in which Sunday is to be observed in the Navy is clearly stated in *Navy Regulations*. No work may be performed on that day and this includes target practice, drills, inspections, and all other ship activities. ("Works of necessity" aboard ship however are excepted and vessels engaged in training the Naval Reserve are not so bound.) It is directed that a suitable compartment be made available for such services and that good order be maintained throughout the ship during this period. Assistance and encouragement are to be given to the chaplain in the conduct of services and, where no chaplain is attached to the ship, the commanding officer is directed to arrange for a visiting naval chaplain to come aboard. If this is not possible, he is to invite, if practicable, a civilian clergyman from ashore to conduct religious services.

Extra duty as a punishment cannot, according to article 1416, paragraph 3, be performed on Sunday. Inspection of personnel and material cannot take place on Sunday (article 0708, paragraph 1). Article 0711, quoted below, must be complied with so far as practicable, even in time of war or national emergency.

0711. Observance of Sunday.

1. Divine services shall be conducted on Sunday if possible. All assistance and encouragement shall be given to chaplains in the conduct of these services, and music shall be made available if practicable. A suitable space shall be designated and properly rigged for the occasion, and quiet shall be maintained throughout the vicinity during divine services. The religious tendencies of individuals shall be recognized and encouraged.

2. Except by reason of necessity or in the interest of the welfare and morale of the command, the performance of work by naval personnel shall not be required on Sunday.

3. (a) When there is no chaplain attached to the command, the commanding officer shall engage the services of any naval or military chaplain who may be available; or, failing in this, shall, when practicable, invite a civilian clergyman to conduct religious services.

(b) Provision shall be made for sending and receiving church parties as appropriate and practicable.

4. Except by reason of necessity, ships of the Navy shall not begin a cruise on Sunday.

5. The provisions of paragraphs 2 and 4 of this article shall not apply to commands engaged in training the naval reserve.

6. Nothing in this article shall be construed as prohibiting authorized work by civilian employees on Sunday.

7. In time of war or national emergency the provisions of this article shall be complied with, so far as practicable.

Conduct in Foreign Countries

The behavior of naval personel when in foreign lands is an important factor in our friendly relations with these countries. *Navy Regulations* is specific in delineating the conduct demanded of Navy men and in pointing out their duties when visiting other countries. It directs that foreign religious institutions and customs be respected; that due deference be shown the local laws, customs, ceremonies, and regulations; that all possible cause of offense to the authorities and inhabitants be avoided and further that a feeling of good will and mutual respect be cultivated. The following articles deal with this important subject.

1215. Foreign Religious Institutions.

The religious institutions and customs of foreign countries visited by persons in the naval service shall be respected.

0623. Dealings With Foreigners.

The senior officer present shall uphold the prestige of the United States. He shall impress upon officers and men that when in foreign ports it is their duty to avoid all possible causes of offense to the authorities or inhabitants; that due deference must be shown by them to the local laws, customs, ceremonies, and regulations; that in all dealings with foreigners, moderation and courtesy should be displayed; and that a feeling of good will and mutual respect should be cultivated.

Precedence of Seniors

The deference shown to senior officers is in accordance with tradition, courtesy, and *Navy Regulations.* The following articles illustrate this point:

2112. Other Marks of Respect.

1. Juniors shall show deference to seniors at all times by recognizing their presence and by employing a courteous and respectful bearing and mode of speech toward them.

2. Juniors shall stand at attention, unless seated at mess, or unless circumstances make such action impracticable or inappropriate:

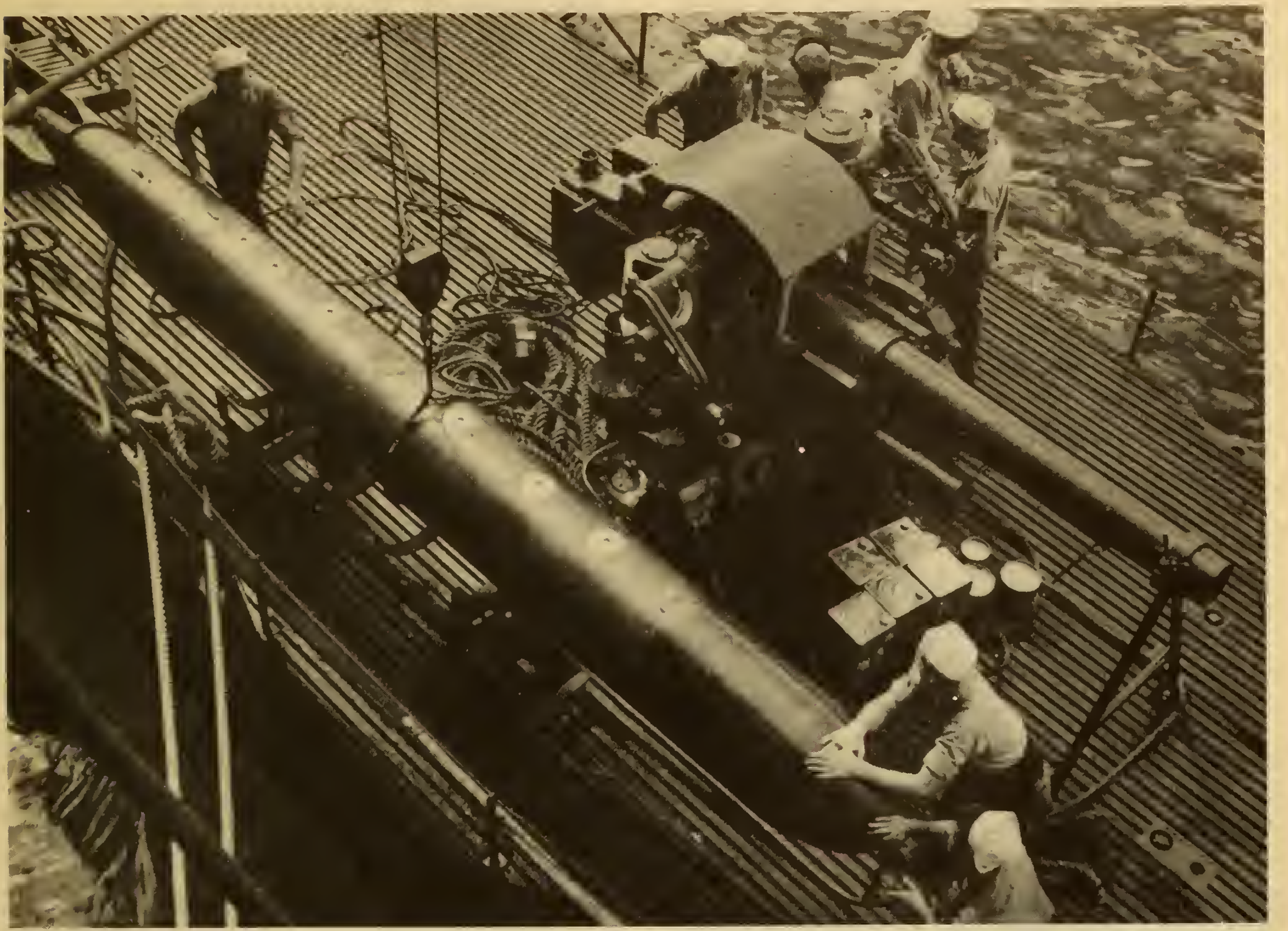
(a) When addressed by an officer senior to them.

(b) When an officer of flag or general rank, the commanding officer or an officer senior to him in the chain of command, or an officer making an official inspection enters the room, compartment, or deck space where they may be.

3. Juniors shall walk or ride on the left of seniors whom they are accompanying.

4. Officers shall enter boats and automobiles in inverse order of rank and shall leave them in order of rank, unless there is special reason to the contrary. The seniors shall be accorded the more desirable seats.

5. Subject to the requirements of the rules for preventing collisions, junior boats shall avoid crowding or embarrassing senior boats.



SAFETY PRECAUTIONS FOR SHIP AND CREW

Officers are responsible for obeying all safety precautions and for seeing that their men also understand and obey them.

0640. Juniors To Obtain Permission From the Senior Officer Present.

A junior in command shall, when meeting a senior either at sea or in port, obtain permission by signal or otherwise to continue on his course, to anchor or get under way, or to perform any evolution or other act of importance.

Gunnery Safety Precautions

It is obvious that no rules are more important both for the safety of the ship and crew than those dealing with explosives. The responsibility of officers, of course, goes further than mere obedience on their own part. They must carefully educate their men in these safety precautions and see that they are obeyed.

Great indeed is the responsibility of the gunnery officer and this is made clear, in article 0936 which states:

> *0936. Safety Precautions.*
>
> The gunnery officer shall insure that, in each part of the ship where ammunition is stowed or handled or where gunnery appliances are operated, applicable safety orders are posted in conspicuous and accessible places, and that the personnel concerned are frequently and thoroughly instructed and drilled in them.

The stern necessity for implicit obedience to the safety precautions is emphasized in article 0903, paragraph 5. Here it is stated that the head of the department, subject to the orders of the commanding officer, shall:

5. Insure that all prescribed or necessary security measures and safety precautions are strictly observed by all persons within the department and by others who may be concerned with matters under his control. He shall insure that all applicable safety precautions are kept properly posted, in conspicuous and accessible places, and that the personnel concerned are frequently and thoroughly instructed and drilled in their observance.

First-aid Training

Training of officers and enlisted men in first aid aboard ship is required by *Navy Regulations* and is an essential factor in the part played by the medical department in preparing for battle. This is made necessary because, during an actual engagement, members of the medical department are assigned stations which may not be accessible to all members of the ship's personnel. Due to the isolation of each compartment during battle it is often difficult to get the wounded to first-aid stations expeditiously and it devolves upon the personnel at the spot to give the first treatment and on them often depends the life of the patient. It is therefore vitally important that all hands be conversant with the rudiments of the first-aid treatment to be given a wounded man. In article 0970, Specific Duties (of the medical officer), paragraph 7 states that the duties of this officer shall include providing instructions in measures of first aid.

NAVY REGULATIONS AND DISCIPLINE

Extent and Limitations of Authority

Since our main interest is the line officer it would be well to note the extent and limitations of his authority in exercising military command as well as the manner in which he may exercise it. This vital subject of personnel relationship is dealt with in the Articles, but in much greater detail in *Navy Regulations* proper.

REGULATIONS APPLY TO WOMEN IN THE NAVY
The women who are now members of the Regular Navy are governed by the same rules and regulations as the men.

The loyal, obedient, and understanding officer will have no difficulty in carrying out his obligations to his seniors, for the keynote of Navy discipline is expressed in article 1211, paragraph 1 of which states:

> *1211. Compliance with Lawful Orders.*
>
> 1. All persons in the naval service are required to obey readily and strictly, and to execute promptly, the lawful orders of their superiors.

Should any person in the Navy consider himself oppressed by his superior or observe in him any misconduct, he is required to represent such oppression or misconduct to the proper authority as outlined in the following article:

> *1243. Oppression or Other Misconduct by a Superior.*
>
> 1. If any person in the naval service considers himself oppressed by his superiors, or observes in him any misconduct, he shall not fail in his respectful bearing towards such superior, but shall report such oppression or misconduct to the proper authority. Such person will be held accountable if his report is found to be vexatious, frivolous, or false.
>
> 2. A report of oppression by, or misconduct of, a superior shall be made to the immediate commanding officer of the person making the report unless the commanding officer is himself the subject of the report, or is the subordinate of the officer who is the subject of the report.

3. If the immediate commanding officer is the subject of the report, the report shall be in writing and shall be forwarded through the immediate commanding officer and addressed to his immediate superior. If the immediate commanding officer refuses or fails to forward the report within a reasonable time, it may be forwarded direct with an explanation of such course.

4. If a superior of the immediate commanding officer is the subject of the report, the report shall be in writing and shall be forwarded through the immediate commanding officer and the officer who is the subject of the report, and any other officers who may be in the chain of command, to the immediate superior of the officer who is the subject of the report. If any officer through whom the report is forwarded refuses or fails to forward the report within a reasonable time, it may be forwarded direct to his immediate superior with an explanation of such course.

5. An officer receiving a report of oppression or misconduct shall take such action in conformity with these regulations as, in his judgment, justice demands. Any appeal from the action taken shall be addressed to the immediate superior of the officer who shall have taken such action, and shall be forwarded through that officer and through all other officers through whom the previous report was forwarded.

Captain's Duties in Loss of Ship

Article 0778 contains the well-known statement that the captain shall be the last to leave when the order to abandon ship has been given. He must do what he can to protect the survivors and make every reasonable effort to save the log and other valuable papers. Great indeed is the responsibility of the officer who is in command of a naval vessel.

0778. Loss of a Ship.

1. In case of the loss of a ship, the commanding officer shall remain by her with officers and crew so long as necessary and shall save as much Government property as possible. Every reasonable effort shall be made to save the logbook, muster roll, accounts of officers and crew, and other valuable papers.

2. If it becomes necessary to abandon the ship, the commanding officer should be the last person to leave.

3. The commanding officer shall:

(a) Take all possible precautions to protect the survivors and such Government property as has been saved.

(b) Report to the nearest United States naval command, and request instructions and such assistance as is required.

(c) Report the circumstances to the Secretary of the Navy as soon as possible.

Conclusion

A high degree of discipline is indispensable in a military organization. Knowing the rules and strictly adhering to them is essential in the winning of wars. "Stonewall" Jackson said: "Men and officers must obey, no matter what the cost to their feelings, for obedience to orders, instant and unhesitatingly, is not only the life blood of armies, but the security of States. . . ."

CHAPTER 8

RANKS AND RATES

OFFICERS

Ranks of Officers

You, as potential naval officers, will be required to become authorities on the ranks, ratings, and insignia of the Navy. You should also be able to recognize and know the meaning of most of the insignia worn by our other Armed Forces.

An officer in the United States Navy may be either a commissioned officer or a warrant officer. Commissioned officers hold a commission which is granted by the President and signed by the Secretary of the Navy. Warrant officers derive their authority from a warrant which is granted by the Secretary of the Navy.

The commissioned officers' ranks in the Navy which correspond to those of the Army and Marine Corps are shown below. It is interesting to note that the Marine Corps officers, although officially a part of the Navy, have the same ranks as the Army.

NAVY	ARMY, MARINE CORPS, OR AIR FORCE
Fleet Admiral	General of the Army*
Admiral	General
Vice Admiral	Lieutenant General
Rear Admiral	Major General
Commodore	Brigadier General
Captain	Colonel
Commander	Lieutenant Colonel
Lieutenant Commander	Major
Lieutenant	Captain
Lieutenant (junior grade)	First Lieutenant
Ensign	Second Lieutenant

Fleet Admiral. The grade and rank of Fleet Admiral of the United States Navy was established by act of Congress in December 1944. This act permitted the appointment of four officers to this rank on the active list, three of whom were immediately appointed: Admiral William D. Leahy, USN (Ret.), Admiral Ernest J. King, USN (Ret.), and Admiral Chester W. Nimitz, USN (Ret.); and later, Admiral William F. Halsey, Jr. (Ret.).

Although the act which provides for the promotion of these officers is effective until six months after the termination of our recent war, a later act, approved 23 March 1946, gave them the permanent rank of Fleet Admiral. (Admiral George W. Dewey held the rank of Admiral of the Navy by special act of Congress; however this rank lapsed with his death.) The equivalent grade in the Army to Fleet Admiral is General of the Army and four of the latter were appointed. (General John J. Pershing's title was General of the Armies of the United States.)

Commodore. Until 1862 all captains in the United States Navy commanding or having commanded squadrons, were recognized as commodore, though never commissioned as such. Commodore became a fixed rank in 1862, but was abandoned as a rank on the active list in 1899. In 1943 the rank of commodore was reestablished for temporary service in time of war or national emergency.

Flag officers. Naval officers of the rank of commodore and above are known as flag officers, each having the privilege of flying a personal flag on the ship or station to which he is attached. The flag has a blue field with white stars according to the rank of the officer concerned, 1 star designating a commodore; 2 stars, a rear admiral; 3 stars, a vice admiral; 4 stars, an admiral; and 5 stars, a fleet admiral.

Line and staff officers. Naval officers who are eligible to assume military command of ships or stations are designated line officers, being in line of command. All other officers are members of the several staff corps and are specialists in their various fields. At present there are eight staff corps: Medical, Medical Service, Hospital, Dental, Chaplain, Supply, and Civil Engineer and Nurse Corps. (The Medical Corps consists entirely of physicians and surgeons; the Medical Service Corps is made up of pharmacists, medical administrative officers, medical technologists, etc.; the Hospital Corps comprises warrant officers and enlisted corpsmen.) While commissioned members of these corps have all the rights and privileges of their ranks, they are not eligible to assume command except in their own corps. They are known as staff officers, but should not be confused with line officers assigned to staffs of flag officers, and certain other high-ranking officers.

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* Not a Marine Corps or Air Force rank.

Uniforms and Insignia

Excluding dress uniforms, which are not required in wartime, there are three uniforms worn by naval officers: dress whites, service dress blues, and service dress khaki and working uniforms.* The aviation winter working uniform (forestry green) is worn by naval aviators and chief petty officers designated as aviation pilots. They may be worn by other officers attached to aviation commands. The khaki working uniform is authorized for all officers except on leave or liberty. Full details regarding uniforms and insignia are set forth in *Uniform Regulations.* The senior officer present prescribes the uniform of the day that shall be worn by the officers under his command.

An officer's rank is indicated by the gold sleeve stripes on the service dress blue uniform and black sleeve stripes on the aviation winter working uniform (forestry green) and by shoulder marks on the khaki and the white uniform and on overcoats. Above the stripes, all line officers wear a star; staff corps officers wear the appropriate corps device as shown by the following table:

Corps	Corps Device
Medical Corps	Gold oak leaf with silver acorn in center
Dental Corps	Gold oak leaf with two silver acorns at the base
Medical Service Corps	Gold oak leaf with a twig attached to stem
Hospital Corps	Caduceus
Nurse Corps	Gold oak leaf
Chaplain Corps:	
Christian	Cross
Jewish	Tablets of the Ten Commandments with Star of David above
Supply Corps	Gold oak leaf of three branches with three acorns
Civil Engineer Corps	Four gold crossed oak leaves with two silver acorns

The stripes indicating officers' ranks are as follows:

Rank	
Fleet Admiral	One 2-inch stripe and four ½-inch stripes above
Admiral	One 2-inch stripe and three ½-inch stripes above
Vice Admiral	One 2-inch stripe and two ½-inch stripes above
Rear Admiral	One 2-inch stripe and one ½-inch stripe above
Commodore	One 2-inch stripe
Captain	Four ½-inch stripes
Commander	Three ½-inch stripes
Lieutenant Commander	Two ½-inch stripes and one ¼-inch stripe between
Lieutenant	Two ½-inch stripes
Lieutenant (jg)	One ½-inch stripe and one ¼-inch stripe above
Ensign	One ½-inch stripe

With the service dress khaki uniform, the khaki working uniform, and the aviation winter working uniform, officers wear pin-on devices on the shirt collar. Line officers wear the pin-on device indicating rank on both collar tips. Staff officers wear the pin-on device of rank on the right collar tip and a corps device on the left. The rank devices are given below. These are similar in form to rank devices worn by Army, Air Force, and Marine officers, but are somewhat smaller.

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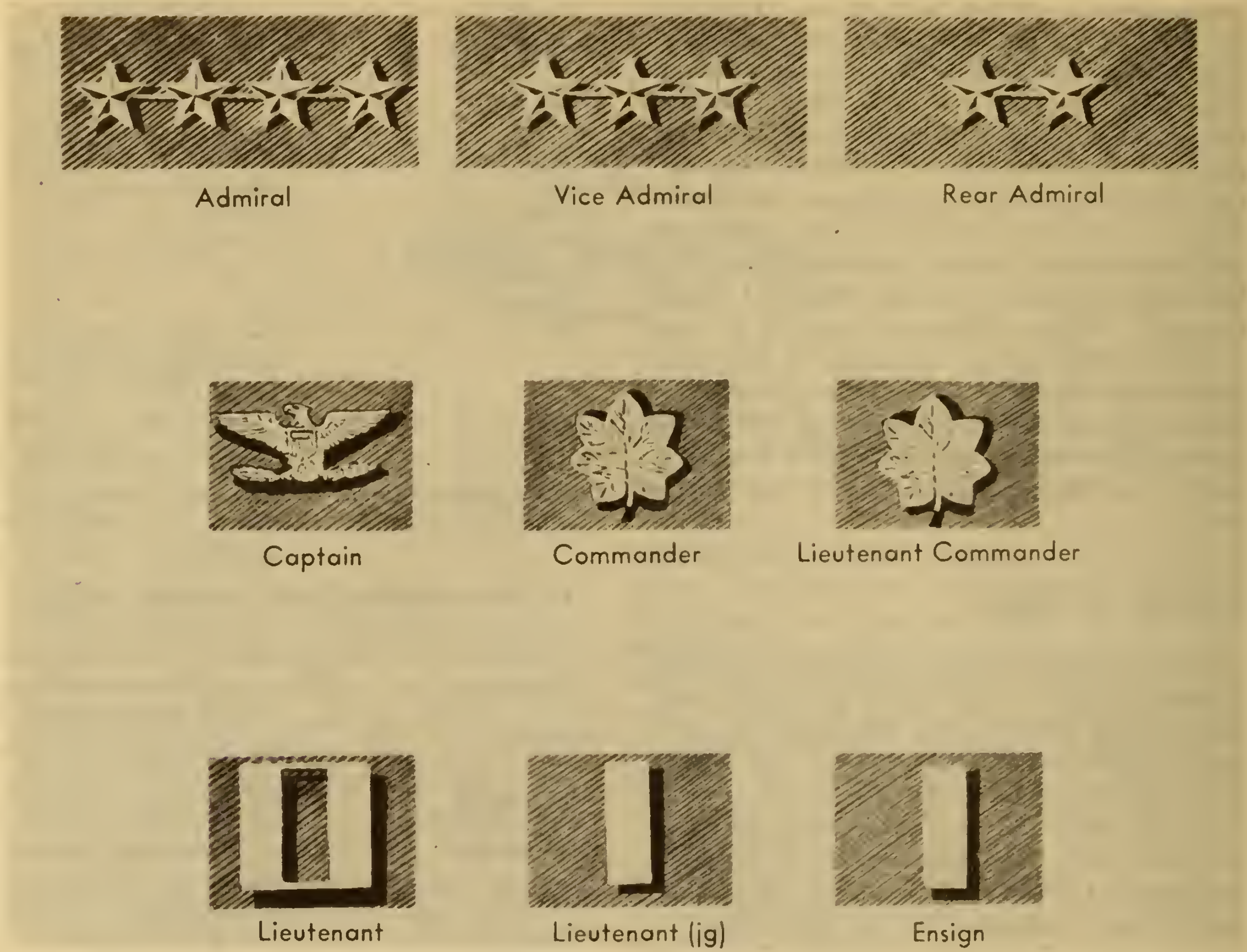
*Regular Navy personnel while actually at sea and Naval Reserves on other than extended active duty may wear the gray working uniform until 15 October 1949. For other naval personnel it has not been authorized since 15 October 1948.



Admiral Vice Admiral Rear Admiral

Captain Commander Lieutenant Commander

Lieutenant Lieutenant (jg) Ensign

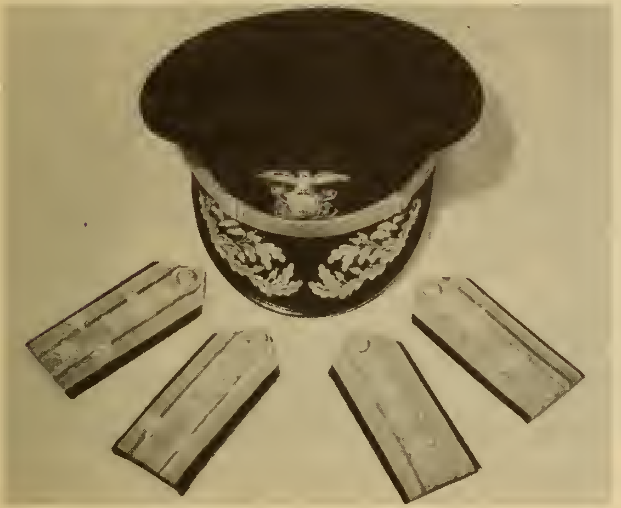
PIN-ON MINIATURE RANK DEVICES

All devices shown are silver except those for ensign and lieutenant commander. The device for fleet admiral is five stars arranged in a pentagon.

RANK	PIN-ON RANK DEVICE
Fleet Admiral	Five silver stars
Admiral	Four silver stars
Vice Admiral	Three silver stars
Rear Admiral	Two silver stars
Commodore	One silver star
Captain	Silver spread eagle
Commander	Silver oak leaf
Lieutenant Commander	Gold oak leaf
Lieutenant	Two silver bars
Lieutenant (jg)	One silver bar
Ensign	One gold bar

Two types of caps may be worn with officers' uniforms, the visored cap and the garrison cap. The visored cap has interchangeable tops of white, navy blue, green or khaki. The white top is worn either with the white or navy blue uniform; the navy blue top is worn with the blue uniform; the green top is worn with the green uniform; and the khaki top is worn with khaki uniforms. Cap covers of black waterproof material are worn for protection against rain.

The visored cap gives no exact indication of rank. On caps worn by officers of the rank of lieutenant commander and below, the visor is black; captains' and commanders' visors are partially gold embroidered in front; flag officers' caps bear full visor embroidery.



VISOR CAP AND SHOULDER MARKS: Officers of Flag Rank
Left to right: Admiral, vice admiral, rear admiral, commodore. Fleet admiral marks (not shown) consist of five stars arranged in a pentagon.

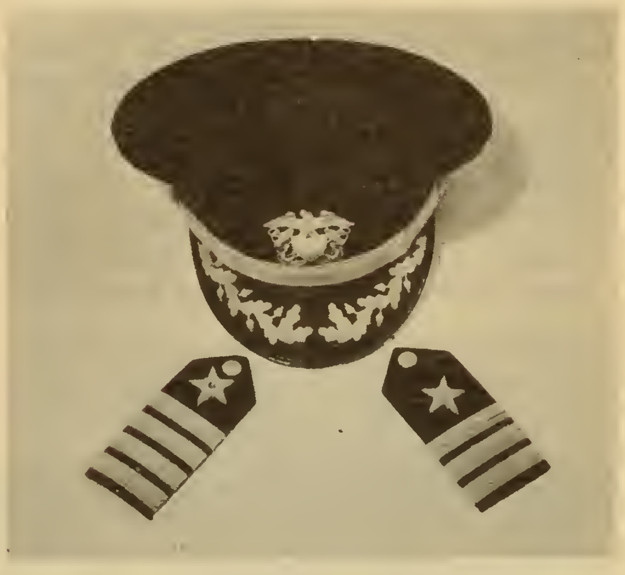
The garrison cap, which is worn when appropriate, may be either green or khaki. Insigne of rank is worn on the right side of the garrison cap, near the front, and a miniature form of the officers' cap device is worn on the left side.

Aiguillettes. Aiguillettes are worn by officers when on duty as personal aides to the President, as aides at the White House, aides to the Secretary, Under Secretary, and Assistant Secretaries of the Navy, aides to flag officers; by naval attaches and assistant attaches; and aides to top ranking representatives of foreign nations visiting the United States. They may be worn on official occasions by commissioned officers appointed as aides on his staff by the governor of a State or Territory. Aides to the President and at the White House wear them on the right side; all others on the left. With overcoats they are worn on the outside.

Service aiguillettes consist of loops of aiguillette cord fastened on the shoulder and going around the shoulder just under the armpit. The aiguillette cord is gold with blue silk insertion. (Both the dress and undress aiguillettes for the aide to the President are made with gold cord without the blue silk insertion.) The number of loops are as follows:

Aide to admiral or official of higher rank: four loops
Naval attache and assistant naval attaches: four loops
Aide to vice admiral: three loops
Aide to rear admiral or officer of lower rank entitled to an aide: two loops
Aide to a governor of a State or Territory: two loops

Dress aiguillettes consist of two single plaits of aiguillette cord with two loops. At the termination of the plaits there are approximately 3 inches of plain cord at the end of which are secured two gilt metal pencils, approximately 3½ inches long, mounted with two silver anchors. They are worn on service uniforms by aides on occasion of ceremony and on social occasions when prescribed.



VISOR CAP AND SHOULDER MARKS: Captain and Commander
Left to right: Captain, commander. Note that the visor embroidery on these caps differs from that of flag rank officers' caps.

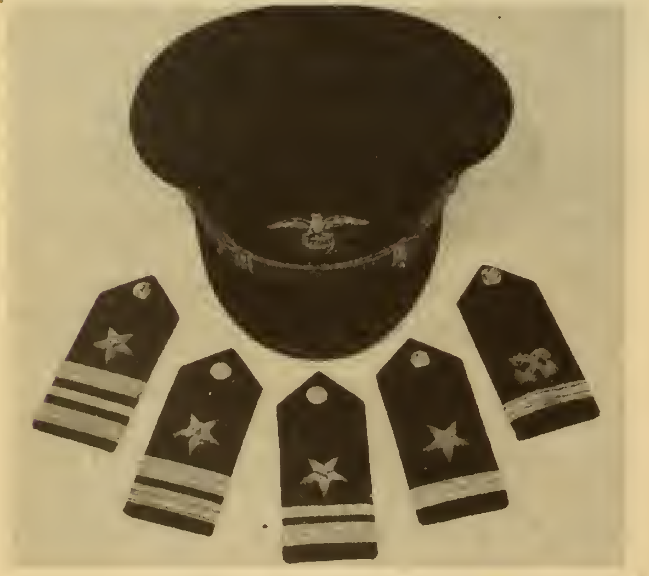
Mourning badges. Officers are required to wear mourning badges when serving as honorary pallbearers at military funerals, when attending military funerals in an official capacity, and at such other times as prescribed by competent authority. Officers attending other funerals may wear mourning badges. They are of black crepe, three inches wide, and are worn on the left sleeve of the outer coat, halfway between the shoulder and elbow.

Warrant and Commissioned Warrant Officers

Warrant officers' uniforms are similar to those of commissioned officers, except for the chin strap on the cap and insignia. On the visored cap is worn a ¼-inch gold chin-strap and a cap device consisting of crossed anchors. The sleeves marking on the blue uniform is a ¼-inch gold stripe broken by blue every two inches. Above it, appears the device indicating the man's specialty, i.e., boatswain, gunner, etc. Such devices embroidered in gold, are as follows:

WARRANT	DEVICE
Boatswain	Crossed fouled anchors
Gunner	Flaming spherical shell
Torpedoman	Torpedo
Electrician	Globe of the world
Radio Electrician	Bolts of lightning
Machinist	Propeller
Carpenter	Carpenter's square
Ship's Clerk	Crossed quills
Aerographer	Circle with vertical arrow and wings
Photographer	Camera
Warrant officer, Hospital Corps	Caduceus
Pay Clerk	Three oak leaves

Shoulder marks worn by warrant officers follow a pattern similar to that of the sleeve marking. The gold stripe, ¼-inch in width, is broken in the center by blue; the device appears inboard. Pin-on corps devices in gold are worn on the collar tips of the shirt of the working uniform and on both sides of the garrison cap.



VISOR CAP AND SHOULDER MARKS:
Lieutenant Commander to Commissioned Warrant Officer
Left to right: Lieutenant commander, lieutenant, lieutenant junior grade, ensign, commissioned warrant officer.

Commissioned warrant officers rank above warrant officers and rank with, but after, ensigns. Their titles are similar to warrants' but are prefixed by the word *chief.*

The commissioned warrant officer's uniform is similar to the commissioned officer's, with a few exceptions. Stripes on sleeves and shoulder marks are ½-inch in width, broken by blue every two inches. The cap device is the same as the commissioned officer's, and the garrison cap bears a miniature form of the officer's cap device on the left side and the corps device on the right side. However, on the garrison cap, and on the shirt-collar tips, the pin-on corps device is of silver.

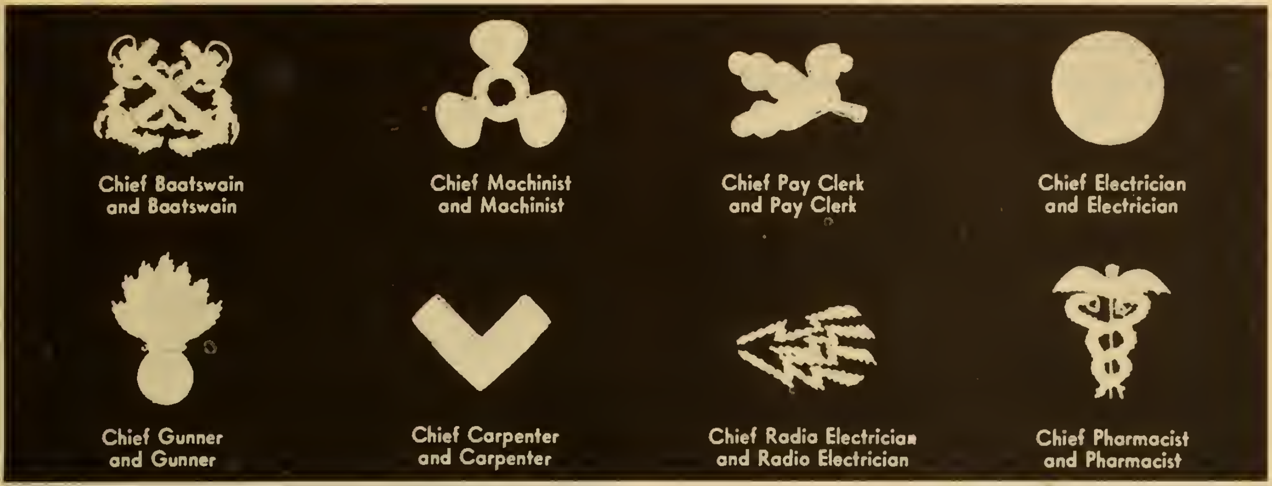
Medals and Other Insignia

It is said that Alexander the Great, the general who at the ripe age of thirty-three ran out of worlds to conquer, began the custom of awarding medals for heroism on the battlefield more than 2,000 years ago. Thus there is a historic precedent for the medals worn by military personnel all over the world. The bewildering array of little ribbons on the left breast of the dress uniform of veterans often seems quite puzzling to the newcomer in the Navy. These distinctive ribbons—and there are many of them—represent the medals which are too cumbersome to be worn at all times. They are worn in horizontal rows of three each, arranged in order of precedence from the center of the body to the left shoulder. (See Appendix for fuller discussion of decorations and medals.)

These medals may be considered briefly under three headings:

1. *Personal awards.* Examples—The Navy Cross and the Distinguished Flying Cross. (Additional awards of these medals are indicated by stars.)

2. *Campaign and service medals.* Examples—The Nicaraguan Campaign (1912), Victory Medal (First World War), American Defense Service Medal (service during the limited emergency from 8 September


Chief Boatswain and Boatswain
Chief Machinist and Machinist
Chief Pay Clerk and Pay Clerk
Chief Electrician and Electrician
Chief Gunner and Gunner
Chief Carpenter and Carpenter
Chief Radio Electrician and Radio Electrician
Chief Pharmacist and Pharmacist

WARRANT CORPS DEVICES
Not all warrant corps devices are shown here. (Chief Pharmacist is now Chief Warrant Officer, Hospital Corps.)

1939 to declaration of war), and Asiatic-Pacific Area Campaign Medal of World War II. Major engagements in the area are indicated by bronze stars on the ribbon.

3. *Special qualification medals.* Examples—Rifle and Pistol Shot's Medals.

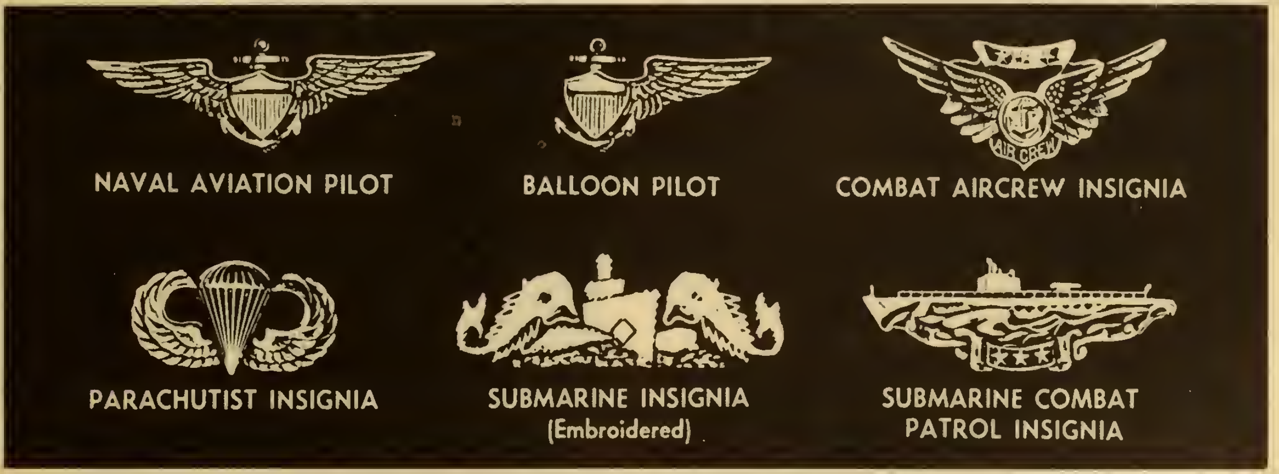
Examples of other special insignia are:

The submarine insigne consisting of a submarine flanked by dolphins, worn by officers who have qualified in submarines. Enlisted men qualified in submarines wear an embroidered distinguishing mark. Submarine combat insigne is worn by officers and enlisted personnel who have participated in successful combat patrols.

Officers designated as naval aviators, naval aviation observers, and flight surgeons wear appropriate winged insigne. Aircrew insigne is worn by all qualified members of a combat airplane. All the above insignia are worn on the left breast.

United States Coast Guard

The distinguishing mark of all Coast Guard uniforms is the Coast Guard shield. This appears above the stripes on the sleeves and shoulder markings of


NAVAL AVIATION PILOT
BALLOON PILOT
COMBAT AIRCREW INSIGNIA
AIR CREW
PARACHUTIST INSIGNIA
SUBMARINE INSIGNIA (Embroidered)
SUBMARINE COMBAT PATROL INSIGNIA

BREAST INSIGNIA WORN ON LEFT BREAST
Shown above are some of the breast insignia worn by men who have special qualifications or have won certain distinctions.

commissioned officers. It accompanies the specialty device on uniforms of warrant officers and is worn on the right sleeve of the enlisted men's uniform, being white on the blues and blue on the whites.

The eagle on the officer's cap device is of gold and is perched on a horizontal anchor. The shield, centered on the eagle's breast, is of silver.

Except for the presence of the shield on the uniforms and the difference in the officer's cap device, Coast Guard uniforms are identical with the uniforms of the Navy.

There are no staff corps officers in the Coast Guard branch. All such duties are performed by the staff corps of the Navy.

Naval Academy Midshipmen

Naval Academy midshipmen are classified as officers of the line but are officers only in a qualified sense. They rank between warrant officers and chief warrant officers. Their uniforms consist of service dress blue, and khaki; dress white; and khaki, white, and blue working. These uniforms are similar to officers' except that the white working uniform is like that worn by enlisted men and the blue working uniform consists of a navy blue shirt, blue trousers, etc. (no coat).

A gold anchor pin-on device is worn on each collar tip of the blue uniform. Distinguished midshipmen of each class (those who have attained 85 percent of the multiple in the preceding year) wear a pin-on gold star above each collar anchor. On the sleeves of the blue coat, class insignia are as follows:

First Class: One horizontal gold stripe around each sleeve.

Second Class: Two diagonal gold stripes on the left sleeve only. The stripes are between the elbow and cuff with the higher end along the rear seam and lower end to the front.

Third Class: One diagonal gold stripe on the left sleeve only. It is located between the elbow and cuff similarly to those described above.

Fourth Class: No sleeve stripe.

In lieu of sleeve stripes denoting class, midshipmen officers wear gold sleeve stripes in a horizontal position around each sleeve of the blue coat to denote rank as follows:

Midshipman Captain: Six stripes

Midshipman Commander: Five stripes

Midshipman Lieutenant Commander: Four stripes

Midshipman Lieutenant: Three stripes

Midshipman Lieutenant (junior grade): Two stripes

Midshipman Ensign: One stripe

Above the upper stripe each midshipman officer wears a five-pointed gold star.

In addition to sleeve stripes denoting class, midshipmen petty officers wear gold insignia midway between the elbow and shoulder on the right sleeve of the blue coat as follows:

Brigade Chief Petty Officer: Anchor surmounted by an eagle with three stars arranged pyramidically above the eagle. Below the anchor there are three chevrons with the upper chevron continuing into and forming

COMMISSIONED OFFICER'S DRESS WHITE UNIFORM
With the white uniform, white shoes, white cap cover, white sox, and visor cap are worn.

the arc of a circle between the ends of the upper chevron, the arch running through the stock of the anchor.

Regimental Chief Petty Officer: Same as for brigade chief petty officer except that there are only two stars.

Battalion Chief Petty Officer: Same as for regimental chief petty officer except that there is only one star.

Company Chief Petty Officer: Same as for battalion chief petty officer except that there is no star.

Platoon Petty Officer, First Class: Same as for company chief petty officer except that there is no arch above the chevrons.

Platoon Petty Officer, Second Class: Same as for platoon petty officer, except that there are only two chevrons below the anchor.

On the khaki and white coats and the blue overcoat gold shoulder marks are worn. The insignia on these shoulder marks are as follows:

Officer Shoulder Marks: Stripes indicating rank similar to those on the sleeves of blue coats, with a gold star above the upper stripe.

OFFICERS' SERVICE DRESS BLUE UNIFORM
The uniform shown above is the Class B uniform: Visor cap, white cap cover, white shirt, and black tie.

Class Shoulder Marks: Markings are as follows:

First Class: One horizontal stripe and a gold foul anchor.

Second Class: Two diagonal stripes and a gold foul anchor.

Third Class: One diagonal stripe and a gold foul anchor.

Fourth Class: Anchor only.

Petty Officer Shoulder Marks: Midshipmen first and second class designated as petty officers wear shoulder marks similar to class shoulder marks for midshipmen, first and second class, respectively, except that instead of a gold foul anchor there is a device consisting of a gold foul anchor surmounted by a spread eagle.

On the collar tips of blue and khaki shirts miniature pin-on anchor, eagle or rank insignia are worn as appropriate. The anchor insigne is a gold foul anchor; the eagle insigne consists of a gold foul anchor surmounted by a spread eagle; and the rank insignia consist of gold bars (one bar for each stripe prescribed for sleeve insignia of the midshipman rank). These insignia are worn as follows:

Midshipmen Officers: Rank device on each collar tip.

Midshipmen Petty Officers: Midshipmen first class wear eagle insignia on each collar tip. Midshipmen second class wear eagle insignia on the right collar tip and anchor insignia on the left collar tip.

Midshipmen, First Class: Eagle insignia on right collar tip.

Midshipmen, Second Class: Anchor insignia on each collar tip.

Midshipmen, Third Class: Anchor insignia on right collar tip.

Midshipmen, Fourth Class: No collar insignia.

Aiguillettes are worn when prescribed by the Commandant of Midshipmen.

Naval Academy midshipmen wear a combination cap (similar to that of officers) with the cap device consisting of a gold pin-on foul anchor. The cap visor is a polished black finish and the chin strap 3/8-inch wide gold lace secured by two (22½-line) gilt buttons.

Naval Academy midshipmen of the Drum and Bugle Corps wear a gold embroidered bugle on the right sleeve just below the elbow. Midshipman Drum and Bugle Corps Commander wears an additional five-pointed gold embroidered star just above the bugle.

A Navy "E," awarded to each midshipman of the company winning the inter-company competition for the brigade flag, is worn on the right sleeve of the blue coat between the shoulder and elbow. It consists of a yellow embroidered block letter "E."

Naval Academy midshipmen do not wear garrison caps.

Naval Aviation Midshipmen

Naval aviation midshipmen's uniforms consist of service dress blue, service dress white, service dress khaki, blue, green and aviation winter working (aviation midshipmen, first class, only). Their uniforms are similar to officers' uniforms, except that the blue working uniform consists of a navy blue shirt, blue trousers, etc. (no coat) and the green working uniform consists of khaki shirt, green trousers, O.D. jacket, etc.

A gold anchor pin-on device is worn on each collar tip of the blue uniform coat. On the sleeves of the blue coat, class insignia are as follows:

Midshipmen First Class: One horizontal gold stripe around each sleeve.

Midshipmen Second Class: Two gold stripes on the left sleeve only. The stripes are between the elbow and cuff and extend diagonally down from the rear seam to the front seam.

Fledglings: One gold stripe on the left sleeve only, between the elbow and cuff and extending diagonally down from the rear seam to the front seam.

Plebes: No sleeve stripes.

In addition to gold sleeve stripes denoting class on the blue coat, midshipmen officers wear short gold sleeve stripes denoting rank on the right sleeve as follows. These stripes are 1 inch long and ⅛-inch wide.

Midshipman Commander: Five stripes.

Midshipman Lieutenant Commander: Four stripes.

Midshipman Lieutenant: Three stripes.

Midshipman Lieutenant (junior grade): Two stripes.

Midshipman Ensign: One stripe.

AVIATION WORKING UNIFORM

This is the winter working uniform worn by aviation officers. The color is forestry green and the sleeve stripes are black. Summer uniform is khaki.

Above the upper stripe each midshipman officer wears a five-pointed gold star.

A bronze anchor pin-on device is worn on each collar tip of the aviation winter working uniform coat (aviation midshipmen, first class, only). Sleeve stripes are of black braid and of the same size and worn in the same manner as gold class sleeve stripes prescribed for the blue coat.

On the khaki and white coats, gold shoulder marks are worn. The insignia on these shoulder marks are as follows:

Midshipmen First Class: One horizontal gold stripe and a gold foul anchor.

Midshipmen Second Class: Two diagonal gold stripes and a gold foul anchor.

Fledglings: One diagonal gold stripe and a gold foul anchor.

Plebes: A gold foul anchor.

All midshipmen, except midshipmen officers and plebes, wear miniature pin-on gold foul anchor insignia on the collar tips of blue and khaki shirts. In lieu of anchor insignia on both collar tips of the blue and khaki shirts, midshipman officers wear rank insignia. These insignia consist of gold bars: one for ensign, two for lieutenant (jg), three for lieutenant, four for lieutenant commander, and five for commander. Midshipmen officers also wear collar rank insignia on the collar of the white coat.

The combination cap (together with cap device, cap visor, and chin strap) is the same as that prescribed for Naval Academy midshipmen.

Khaki garrison cap may be worn with khaki uniforms; a green garrison cap is worn with the green working uniform and may be worn with the aviation winter working uniform. A gold anchor pin-on device, similar to that worn on the blue coat collar tip, is worn on the left side of the garrison caps.

NROTC Midshipmen

NROTC uniforms consist of service dress blue, and blue, khaki, and white working uniforms. These are similar to officers' uniforms except that the white working uniform is similar to that worn by enlisted men and the blue working uniform consists of a navy blue shirt, blue trousers, etc. (no coat).

NROTC midshipmen wear a combination cap (similar to officers') with a gold embroidered cap device consisting of an anchor with the letters "U S N" and "R O T C" superimposed. The cap visor has a polished black finish and the chin strap is 3/8-inch wide gold lace secured by two (22½-line) gilt buttons. A khaki garrison cap may be worn with the khaki working uniform.

A gold embroidered corps device is worn on the left sleeve of the blue coat between the elbow and shoulder. This corps device is of the same size and design as the gold embroidered cap device on the combination cap.

Classes in the NROTC, regardless of the curricula they may be following, are indicated on the blue uniform by gold lace stripes below the NROTC corps device as follows: seniors, three stripes; juniors, two stripes; sophomores, one stripe; and freshmen, no stripes.

The insigne of rank of NROTC student officers consists of gold stripes on each sleeve of the blue coat. These stripes (2½ in. long and 1/8-in. wide) are as follows:

Student Lieutenant Commander: Four stripes
Student Lieutenant: Three stripes
Student Lieutenant (junior grade): Two stripes
Student Ensign: One stripe

Student officers also wear a five-pointed gold star above the upper stripe.

Student petty officers wear the following insignia midway between the elbow and shoulder on the right sleeve of the blue coat.

Battalion Chief Petty Officer: Anchor surmounted by an eagle with three stars arranged pyramidically above the eagle. Below the anchor there are three chevrons with the upper chevron continuing into and forming the arc of a circle between the ends of the upper chevron. The arch runs through the stock of the anchor.

Company Chief Petty Officer: Same as for battalion chief petty officer except that there are only two stars.

Petty Officer, First Class: Same as for company chief petty officer except that there is only one star.

Petty Officer, Second Class: Same as for petty officer, first class, except that there is only one chevron.

Petty Officer, Third Class: Same as for petty officer, second class, except that there is no chevron.

Petty Officer, Fourth Class: Same as for petty officer, third class, except that there is no star.

A gold foul anchor pin-on device is worn on each collar tip of the blue uniform.

On the collar tips of blue and khaki shirts, student officers wear miniature pin-on rank insignia. These insignia consist of gold bars: one for student ensigns, two for student lieutenants (jg), three for student lieutenants, and four for student lieutenant commanders. NROTC midshipmen, except student officers, wear a gold pin-on corps device on the collar tips of blue and khaki shirts. All NROTC midshipmen wear the gold pin-on corps device on the left side of the khaki garrison cap.

Women's Uniforms

The basic uniforms for women are the navy blue uniform, the white dress uniform, and the grey and white pin-striped seersucker working uniform.

In addition, officers of the Nurse Corps have an indoor duty uniform consisting of an ordinary nurse's white uniform and cap. Pin-on device of rank is worn on the right collar tip and pin-on corps device is worn on the left collar tip. On the cap, rank is shown by gold stripes against a broader band of black velvet.

A device consisting of a fouled anchor superimposed on a three-bladed propeller is worn on the jacket lapels of these uniforms by all women except officers of the Nurse Corps. The sleeve braid, indicating a woman officer's rank, is reserve blue in color on navy blue uniforms, white on white. Officers classified as (W) wear a matching star above the sleeve stripe, and staff corps officers wear the appropriate staff corps device. Women petty officers wear rating badges of the same design as those of enlisted men.

The regulation officer's cap device is worn on the woman officer's hat. A metal anchor-propeller insigne worn on the cap band marks the enlisted woman's hat, except for chief petty officers, who wear the same cap insignia prescribed for male chief petty officers. A garrison cap, styled for women, is optional for both officer and enlisted women.

Naval Aviation Cadets

Naval aviation cadets are student naval aviators and rank between chief petty officers and warrant officers. Their uniforms consist of service dress blue, and khaki; dress white; and khaki and green working uniforms. Their uniforms are similar to officers except that the green working uniform consists of khaki shirt, green trousers, O.D. jacket, etc.

A gold anchor pin-on device is worn on each collar tip of the blue uniform coat.

Cadet officers wear gold sleeve stripes denoting rank on the center of the right sleeve of the blue coat. Each cadet officer also wears above the upper stripe a five-pointed gold embroidered star. The number of stripes is as follows:

Cadet Commander: Five stripes
Cadet Lieutenant Commander: Four stripes
Cadet Lieutenant: Three stripes
Cadet Lieutenant (junior grade): Two stripes
Cadet Ensign: One stripe

Gold shoulder marks are worn on the white and the khaki uniform coats. Mounted on these marks is a five-pointed gold star. Cadet officers wear pin-on rank insignia on each side of the collar of the white coat and on each collar tip of the khaki shirt. These insignia consist of gold bars: one for ensign, two for lieutenant (jg), three for lieutenant, and four for lieutenant commander. Aviation cadets other than cadet officers wear the miniature anchor collar insignia on each collar tip of khaki shirts.

Aviation cadets wear a combination cap (similar to officers') with the cap device consisting of a gold pin-on foul anchor. The cap visor has a polished black finish and a chin strap of gold lace $\frac{1}{4}$-inch wide, secured by two gilt buttons.

A gold metal anchor is worn on the khaki garrison cap.

Origin of Officers' Uniforms

Approximately as late as the middle of the 18th century, sailors' dress generally lacked uniformity. The well-known story of the British naval officers, who habitually sought a rendezvous at Will's Coffeehouse, explains the origin of the officers' uniform worn by the Royal Navy. In 1745, after much discussion, these officers drew up a petition and presented it to the Admiralty requesting a prescribed dress. Various patterns and colors were accordingly prepared for inspection, and final selection was made by the King himself. Having seen the Duchess of Bedford riding in a blue habit which greatly took his fancy, he designated that as the color to be adopted by the Royal Navy. An order issued in 1748 notified the fleet of this decision.

The United States Navy has always, to a large extent, adopted the practices of the Royal Navy. It is possible to trace, beginning with the adoption of the uniform in 1776 by the Marine Committee of the Continental Congress and continuing even to the present day, the similarity in the dress of the British and American navies. The Continental Navy, like the Royal Navy, went through debates on color, frills, and insignia to be used to lend the desired effect. No doubt both countries had the same purpose in adopting a uniform; that is, it not only made it possible to distinguish rank, but it also improved the appearance and lifted the morale. It was in 1877 that our Navy adopted the single-breasted blouse with a high military collar. The present double-breasted coat was accepted in 1918. Present-day British and American uniforms differ only in details of ornamentation and insignia.

During the period of the evolution of the uniform, the style of hair and beards also changed. In the 18th century, sailors wore a queue which extended in back like a marlinspike. At the time of the Civil War and the Spanish-American War, a great variety of beards was worn both by officers and men. However, during the period of the War of 1812 and World War I, our officers and men were, in the main, beardless.

The first real attempt to regulate the chaplain's uniform came in 1830 when the chaplains were authorized to wear "a plain black coat, vest and pantaloons." At first the buttons were plain but in 1841 the Navy Department authorized the chaplains to wear the official eagle button. The regulations issued in 1841 introduced some radical changes which authorized the chaplains to wear practically the same uniform as that worn by other naval officers. The chaplains wore the cross on their uniforms for the first time in 1864.

The oak leaf and acorn (symbol of the druid priest-physicians) was first used to symbolize the surgeon and surgeon's mate in 1834 and a simplified form of the earliest symbol is in use today as the medical officer's corps device. The caduceus (classic symbol of the Greek God of medicine) was first adopted in 1886 as the specialty mark for the enlisted rating of apothecary. Upon establishment of the Hospital Corps, the Geneva cross was adopted as the corps device for the warrant officers and enlisted men of that corps. In 1913 the caduceus was prescribed as corps device for Hospital Corps warrant officers and in April 1948 it replaced the red cross as the specialty mark for enlisted corpsmen.

The oak leaf and acorn is the corps device of the Navy Dental Corps; a variation in the arrangement of the acorn distinguishes it from that of the Medical Corps.

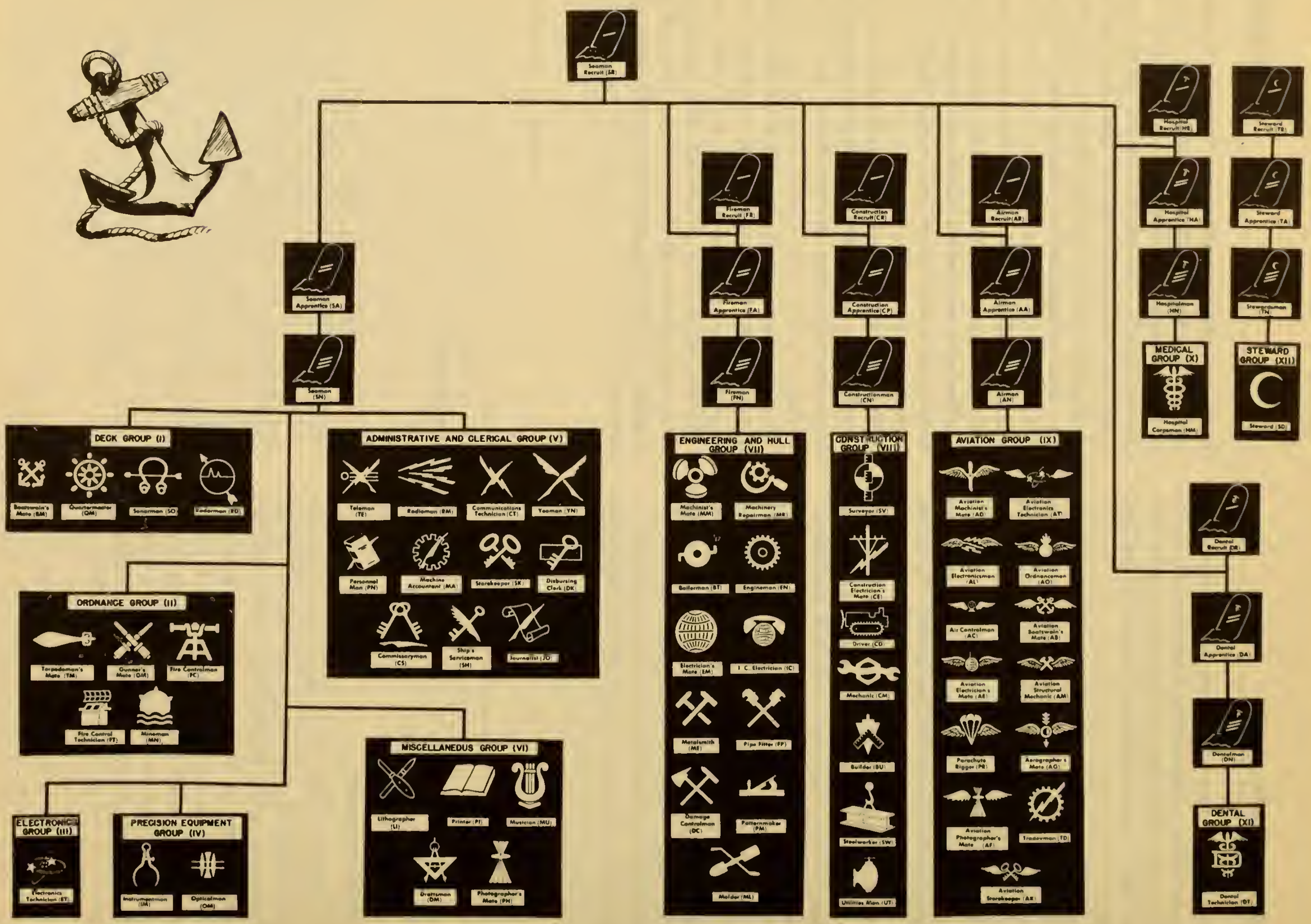
Gold insignia to denote rank, and in the case of staff officers also their special branches, gradually came into use.

Today, the qualities of comfort, service, and appearance mark the naval officer's uniform and, with the exception of full-dress attire, most frills have disappeared.

ENLISTED MEN'S UNIFORMS

Path of Advancement

An individual with no previous naval experience normally enlists as a recruit in pay grade 7, which is the basic pay grade in the Navy's rating structure. From his recruit rate he begins to absorb training in a broad occupational group and to advance in rate or rating as he becomes qualified. After advancing to the apprentice level (pay grade 6) he must qualify for the next higher level (pay grade 5). After advancing to seaman (or fireman, airman, or other distinct pay grade 5 rate) he attempts to qualify fully for the lowest petty officer rate of a particular rating, dependent upon his ability and his inclinations. It is at this level that he chooses the occupational career which he will follow for the remainder of his naval service. Once he is officially designated as a "striker" for a particular rating, or once he has advanced to that rating, he will specialize in that field only. An outline of the pay grade steps is shown on page 151.


Seaman Recruit (SR)
Seaman Apprentice (SA)
Seaman (SN)
DECK GROUP (I)
Boatswain's Mate (BM)
Quartermaster (QM)
Sonarman (SO)
Radarman (RD)
ADMINISTRATIVE AND CLERICAL GROUP (V)
Teleman (TE)
Radioman (RM)
Communications Technician (CT)
Yeoman (YN)
Personnel Man (PN)
Machine Accountant (MA)
Storekeeper (SK)
Disbursing Clerk (DK)
Commissaryman (CS)
Ship's Serviceman (SH)
Journalist (JO)
ORDNANCE GROUP (II)
Torpedoman's Mate (TM)
Gunner's Mate (GM)
Fire Controlman (FC)
Fire Control Technician (FT)
Mineman (MN)
MISCELLANEOUS GROUP (VI)
Lithographer (LI)
Printer (PI)
Musician (MU)
Draftsman (DM)
Photographer's Mate (PH)
ELECTRONICS GROUP (III)
Electronics Technician (ET)
PRECISION EQUIPMENT GROUP (IV)
Instrumentman (IM)
Opticalman (OM)
Fireman Recruit (FR)
Fireman Apprentice (FA)
Fireman (FN)
ENGINEERING AND HULL GROUP (VII)
Machinist's Mate (MM)
Machinery Repairman (MR)
Boilerman (BT)
Engineman (EN)
Electrician's Mate (EM)
I. C. Electrician (IC)
Metalsmith (ME)
Pipe Fitter (FP)
Damage Controlman (DC)
Patternmaker (PM)
Molder (ML)
Construction Recruit (CR)
Construction Apprentice (CP)
Constructionman (CN)
CONSTRUCTION GROUP (VIII)
Surveyor (SV)
Construction Electrician's Mate (CE)
Driver (CD)
Mechanic (CM)
Builder (BU)
Steelworker (SW)
Utilities Man (UT)
Airman Recruit (AR)
Airman Apprentice (AA)
Airman (AN)
AVIATION GROUP (IX)
Aviation Machinist's Mate (AD)
Aviation Electronics Technician (AT)
Aviation Electronicsman (AL)
Aviation Ordnanceman (AO)
Air Controlman (AC)
Aviation Boatswain's Mate (AB)
Aviation Electrician's Mate (AE)
Aviation Structural Mechanic (AM)
Parachute Rigger (PR)
Aerographer's Mate (AG)
Aviation Photographer's Mate (AF)
Tradevman (TD)
Aviation Storekeeper (AK)
Hospital Recruit (HR)
Hospital Apprentice (HA)
Hospitalman (HN)
MEDICAL GROUP (X)
Hospital Corpsman (HM)
Steward Recruit (TR)
Steward Apprentice (TA)
Stewardsman (TN)
STEWARD GROUP (XII)
Steward (SD)
Dental Recruit (DR)
Dental Apprentice (DA)
Dentalman (DN)
DENTAL GROUP (XI)
Dental Technician (DT)

GENERAL SERVICE RATINGS

Normal path of advancement for enlisted man starting as seaman recruit and progressing to petty officer.

RATE	PAY GRADE
seaman recruit, fireman recruit, airman recruit, construction recruit, hospital recruit, dental recruit, steward recruit	7
seaman apprentice, fireman apprentice, airman apprentice, construction apprentice, hospital apprentice, dental apprentice, steward apprentice	6
seaman, fireman, airman, constructionman, hospitalman, dentalman, stewardsman	5
RATING	
petty officer, third class, or steward, third class	4
petty officer, second class, or steward, second class	3
petty officer, first class, or steward, first class	2
chief petty officer, acting appointment, or chief steward, acting appointment	1-A
chief petty officer, or chief steward	1

In comparison with the Army titles, the advancement of a gunner's mate (as an example) is shown below:

NAVY	PAY GRADE	ARMY
seaman recruit	7	recruit
seaman apprentice	6	private
seaman	5	private, first class
gunner's mate, third class	4	corporal
gunner's mate, second class	3	sergeant
gunner's mate, first class	2	sergeant, first class
chief gunner's mate, acting appointment	1A	(none)
chief gunner's mate	1	master sergeant (or first sergeant)

Let us, as an example, trace the advancement of a typical enlisted naval careerist who specializes in the occupational field of a gunner's mate. He first enlists as a seaman recruit (SR). After receiving basic or "boot" training at a recruit training center he finds that his broad interests lie in the deck division of the Navy. He is advanced to seaman apprentice (SA) upon completion of his basic training. Aboard ship he receives general training in seamanship and, in time, qualifies for advancement to seaman (SN). During this time he has become interested in the duties of the gunner's mate rating. By now he is depended upon to a greater degree by his division officers, by his petty officers, and by the men who work with him. He is assigned to gunnery maintenance duties and assists the gunner's mates in the performance of their duties; at this stage he is termed a gunner's mate "striker." Upon qualifying for advancement to the next higher rate in competition with his contemporaries he earns advancement to gunner's mate, third class (GM3). From then on he has recurring opportunities for advancement in succession to gunner's mate, second class (GM2); gunner's mate, first class (GM1); and chief gunner's mate, acting appointment (GMCA). Of course, in advancing to the higher petty officer grades he is required to exhibit a more comprehensive understanding of the technical skills of a gunner's mate and a more definite grasp of leadership as a petty officer.

After serving with unquestioned ability as a chief gunner's mate, acting appointment, for a set period, he is eligible for appointment to chief gunner's mate (GMC), the highest enlisted rate of his occupational line of work.

As a GM1 or higher, the individual is eligible for competitive selection to warrant officer (gunner, in this case) or to ensign—limited duty officer (specializing in gunnery).

Subject to standard instructions, lateral changes from one group to another are allowed quite freely in the lower pay grades before a man has been given much training in any one particular field of work. This allows him time to find his future field of work in the Navy. However, once a man has qualified as a striker or has advanced to any rating, lateral changes are permitted only in very rare cases.

The following is a list of the petty officer ratings, their insignia (see also chart of general service ratings), and the abbreviations.

Petty Officer Ratings

	Rating	Insigne	Abbreviation
I.	**Deck Group**		
	Chief Boatswain's Mate	Crossed anchors	BMC
	Boatswain's Mate, 1	Crossed anchors	BM1
	Boatswain's Mate, 2	Crossed anchors	BM2
	Boatswain's Mate, 3	Crossed anchors	BM3
	Quartermaster, 3, 2, 1, Chief	Ship's wheel	QM
	Sonarman, 3, 2, 1, Chief	Earphones and arrow	SO
	Radarman, 3, 2, 1, Chief	Arrow through oscilloscope	RD
II.	**Ordnance Group**		
	Torpedoman's Mate, 3, 2, 1, Chief	Torpedo	TM
	Gunner's Mate, 3, 2, 1, Chief	Crossed guns	GM
	Fire Controlman, 3, 2, 1, Chief	Rangefinder	FC
	Fire Control Technician, 3, 2, 1, Chief	Mk. 37 director	FT
	Mineman, 3, 2, 1, Chief	Floating mine	MN
III.	**Electronics Group**		
	Electronics Technician, 3, 2, 1, Chief	Electrons revolving around helium atom	ET
IV.	**Precision Instrument Group**		
	Instrumentman, 3, 2, 1, Chief	Calipers	IM
	Opticalman, 3, 2, 1, Chief	Lenses crossed by lines of light	OM
V.	**Administrative and Clerical Group**		
	Teleman, 3, 2, 1, Chief	Crossed quill and spark on postal cancellation mark	TE
	Radioman, 3, 2, 1, Chief	Four sparks	RM
	Communications Technician, 3, 2, 1, Chief	Crossed quill and spark	CT
	Yeoman, 3, 2, 1, Chief	Crossed quills	YN
	Personnel Man, 3, 2, 1, Chief	Crossed manual and quill	PN
	Machine Accountant, 3, 2, 1, Chief	Quill on gear	MA
	Storekeeper, 3, 2, 1, Chief	Crossed keys	SK
	Disbursing Clerk, 3, 2, 1, Chief	Key on check	DK
	Commissaryman, 3, 2, 1, Chief	Two keys with quill underneath	CS
	Ship's Serviceman, 3, 2, 1, Chief	Crossed key and quill	SH
	Journalist, 3, 2, 1, Chief	Crossed quill and scroll	JO
VI.	**Miscellaneous Group**		
	Lithographer, 3, 2, 1, Chief	Crossed litho crayon holder and scraper	LI
	Printer, 3, 2, 1, Chief	Open book	PI
	Musician, 3, 2, 1, Chief	Lyre	MU
	Draftsman, 3, 2, 1, Chief	Compass on triangle	DM
	Photographer's Mate, 3, 2, 1, Chief	Lens pierced by light lines	PH
VII.	**Engineering and Hull Group**		
	Machinist's Mate, 3, 2, 1, Chief	Three-bladed propeller	MM
	Machinery Repairman, 3, 2, 1, Chief	Micrometer and gear	MR
	Boilerman, 3, 2, 1, Chief	Hero's boiler with vents discharged	BT
	Engineman, 3, 2, 1, Chief	A gear	EN
	Electrician's Mate, 3, 2, 1, Chief	Globe	EM
	I. C. Electrician, 3, 2, 1, Chief	Phone over globe	IC
	Metalsmith, 3, 2, 1, Chief	Crossed mauls	ME
	Pipe Fitter, 3, 2, 1, Chief	Crossed pipe-wrenches	FP
	Damage Controlman, 3, 2, 1, Chief	Crossed fire-ax and maul	DC
	Patternmaker, 3, 2, 1, Chief	Wooden jack plane	PM
	Molder, 3, 2, 1, Chief	Crossed bench rammer and stove tool	ML
VIII.	**Construction Group**		
	Surveyor, 3, 2, 1, Chief	Level rod with measuring scale to front	SV
	Construction Electrician's Mate, 3, 2, 1, Chief	Spark superimposed on telephone pole	CE
	Driver, 3, 2, 1, Chief	Bulldozer	CD
	Mechanic, 3, 2, 1, Chief	Wrench on nut	CM
	Builder, 3, 2, 1, Chief	Carpenter's square on plumb bob	BU
	Steelworker, 3, 2, 1, Chief	I-beam suspended from hook	SW
	Utilities Man, 3, 2, 1, Chief	Valve	UT

Petty Officer Ratings, Cont.

	Rating	Insigne	Abbreviation
IX.	**Aviation Group**		
	Aviation Machinist's Mate, 3, 2, 1, Chief	Two-bladed propeller, winged	AD
	Aviation Electronics Technician, 3, 2, 1, Chief	Helium atom with revolving electrons, winged	AT
	Aviation Electronicsman, 3, 2, 1, Chief	Three sparks, winged	AL
	Aviation Ordnanceman, 3, 2, 1, Chief	Flaming spherical shell, winged	AO
	Air Controlman, 3, 2, 1, Chief	Microphone, winged	AC
	Aviation Boatswain's Mate, 3, 2, 1, Chief	Crossed anchors, winged	AB
	Aviation Electrician's Mate, 3, 2, 1, Chief	Globe, winged	AE
	Aviation Structural Mechanic, 3, 2, 1, Chief	Crossed mauls, winged	AM
	Parachute Rigger, 3, 2, 1, Chief	Parachute, winged	PR
	Aerographer's Mate, 3, 2, 1, Chief	Circle on vertical arrow, winged	AG
	Aviation Photographer's Mate, 3, 2, 1, Chief	Lens pierced by light lines, winged	AF
	Tradevman, 3, 2, 1, Chief	Spark passing through gear	TD
	Aviation Storekeeper, 3, 2, 1, Chief	Crossed keys, winged	AK
X.	**Medical Group**		
	Hospital Corpsman, 3, 2, 1, Chief	Caduceus	HM
XI.	**Dental Group**		
	Dental Technician, 3, 2, 1, Chief	Letter D on caduceus	DT
XII.	**Steward Group**		
	Steward, 3, 2, 1, Chief	Crescent	SD

Uniforms

Two distinctive uniforms are worn by enlisted personnel:

The characteristic bluejacket's uniform, in blue or white, with jumper and 13-button bell-bottom trousers (in blues)* is worn by all nonrated men and by all petty officers below chief petty officers. (Men in steward's group ratings in pay grades, 4, 3, 2, and 1 wear uniforms similar to those prescribed for chief petty officers.)

The chief petty officer's uniform is similar to that worn by commissioned officers except that the white uniform is a four-button sack coat. Also no shoulder marks are worn. The whites are cut like the blue uniforms instead of the high-collar type. Insignia differ considerably.

Head covering worn by the bluejackets is the typical sailor hat in white or the blue flat-topped hat (no visor) with band reading U S NAVY. The chief petty officer wears a visor cap of the officer type, but the chin strap is black leather and the insigne is a foul anchor with U S N across it. Chief petty officers also wear khaki or green garrison caps with the miniature anchor U S N device pinned to the right side. The chief steward's cap is the same as the chief petty officer's visor cap. The steward's cap is also the same as the chief petty officer's visor cap except that the insigne is U S N without the anchor, and the buttons on the chin strap are black.

Enlisted personnel may be required to wear mourning badges and white gloves in connection with military funerals providing the badges are furnished at no cost to the individual. Enlisted personnel attending other funerals may wear mourning badges if they so desire.

Insignia

A rating badge is worn by all petty officers, including chief petty officers. It consists of an eagle, an embroidered insigne indicating a specialty, and chevrons which are V-shaped. One chevron denotes a PO3, two a PO2, three a PO1, and three with a half circle enclosing the top denotes a CPO. Rating badges are red on blue uniforms and blue on white, khaki, and green uniforms. Enlisted personnel meeting certain qualifications are authorized to wear gold rating badges on blue uniforms. All chief petty officers are required to

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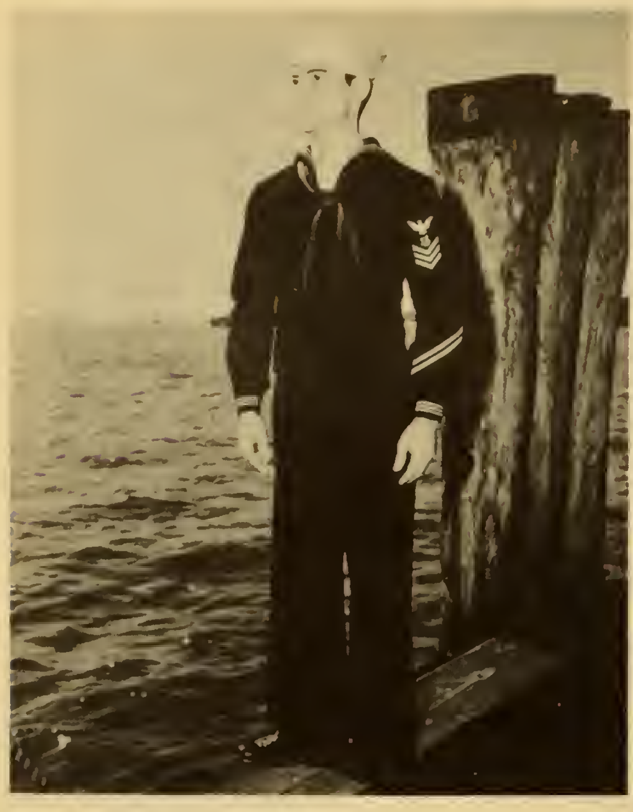
* A recent change authorized conventional trousers and coat-style cuffs on the blue dress jumper. A date for official adoption of this uniform has not as yet been established.



ENLISTED MEN'S DRESS BLUE UNIFORM
This is the characteristic bluejacket's uniform which will eventually be replaced by a uniform that features conventional type trousers and a jumper with coat-style cuffs.

wear silver rating badges on blue uniforms and on service dress khakis, unless they are qualified to wear gold rating badges. However, the gold rating badges are worn only on blue uniforms. All badges are worn on the left upper arm.

Nonrated enlisted personnel wear group-rate marks which consist of diagonal stripes ¼-inch wide and 3 inches long, mounted on a rectangular background matching the color of the uniform. They are worn on the left sleeve of the blue and the white uniforms, between shoulder and elbow, in the same position as a rating badge. They are placed at an angle of 30° from horizontal and with the lower ends to the front. Nonrated men of the fifth pay grade wear three stripes; sixth pay grade wear two stripes; and seventh pay grade wear one stripe. These stripes, alone or in a combination with specialty marks, or strikers' marks (see below) indicate the rating and/or group to which a nonrated man belongs as follows:

Seaman, seaman apprentice, and seaman recruit: White stripes on blue uniforms; blue on white.

Fireman, fireman apprentice, and fireman recruit: Red stripes on blue and white uniforms.

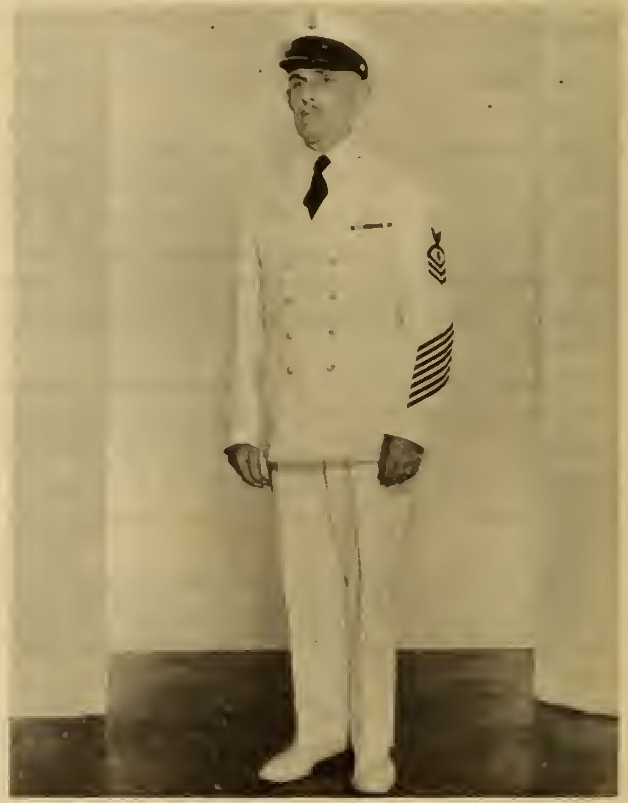
Airman, airman apprentice, and airman recruit: Emerald green stripes on blue and white uniforms.

Hospitalman, hospital apprentice, and hospital recruit: White stripes on blue uniforms; blue on white. The hospital corpsman's specialty mark is centered immediately above the patch on which the stripes are mounted.

Dentalman, dental apprentice, and dental recruit: White stripes on blue uniforms; blue on white. Dental technician's specialty mark is centered immediately above the patch on which the stripes are mounted.

Constructionman, construction apprentice, and construction recruit: Light blue stripes on blue and on white uniforms.

Stewardsman, steward apprentice, and steward recruit: White stripes on blue uniforms; blue on white.



CHIEF PETTY OFFICER WEARING DRESS WHITES
Rating badges on the white uniforms are blue; the buttons are gold.

The steward's specialty mark is centered immediately above the patch on which the stripes are mounted.

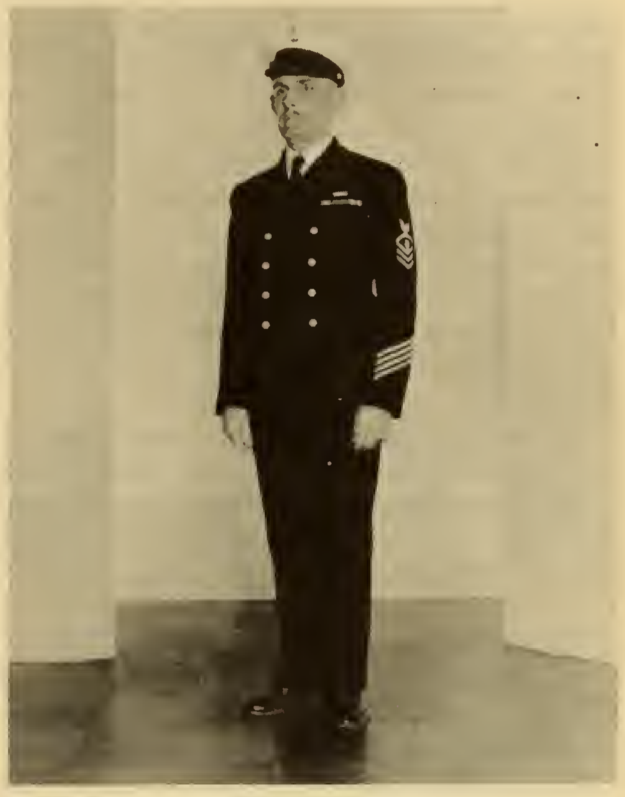
Nonrated men who are qualified and have been designated as strikers wear the specialty mark of the rating for which they are striking. These marks are worn midway between the shoulder and elbow on the left sleeve, centered immediately above the rectangular background of the group-rate marks.

Service stripes ("hashmarks") are diagonal stripes, 3/8-inch wide and 7 inches long, worn on the left lower arm, each representing 4 years of active duty in the Navy, Marine Corps, Coast Guard, or Army, or active service in the Naval Reserve. (Fleet Reserve service counts.) They are red on blue uniforms and blue on whites, khakis, or greens. When gold hashmarks are worn, gold rating badges are worn.

Certain distinguishing marks are worn by men who have special qualifications or who have won certain distinctions. Some of these are:

1. Gun captains wear a gun design on the right sleeve.
2. Men in submarine service wear embroidered submarine insigne on the left breast.
3. Men in airship duty wear an airship design on the right sleeve.
4. The Navy "E" is worn by all enlisted members of the crew of ships or aircraft squadrons, or on the staff of unit commanders who are awarded prize money in conjunction with the award of the Battle Efficiency Pennant to their ship, aircraft squadron, or unit by the Chief of Naval Operations in accordance with current instructions. The "E" is worn for one year during such time as the Battle Efficiency Pennant is flown by the unit(s) entitling them to prize money.
5. Sharpshooters wear a bull's eye with a single ring on the right sleeve.
6. Expert riflemen wear medals and ribbons.
7. Divers wear design of diving hood on the right sleeve. Types differ for various grades.
8. Seaman gunners wear exploding bomb on right sleeve.

It should be remembered that no watch chains, fobs, pins, or other jewelry should be worn exposed upon the uniform by officer or enlisted personnel of the Navy, except sleeve buttons or shirt studs as prescribed, and authorized decorations, medals, and ribbons.



CHIEF PETTY OFFICER
This is the dress blue uniform with which the blue cap cover may be worn when authorized. Each service stripe ("hashmark") indicates four years of active duty.

ORIGIN OF UNIFORM ORNAMENTS

Jumper Collar and Cuffs

The uniform of the bluejacket of today, although distinctive in its details in each of the navies of the world, has a general form which is more or less common to all. This form is the result of years of custom, and had its origin in reasons of utility. The sailors of the American Navy of 1776 had no official uniform and there was nothing before 1852 to prevent the seaman from ornamenting his costume in any way he fancied.

The old salt of sailing ship days wore his hair braided into a pigtail and "clubbed" or doubled up into a knot and tied at the back of his neck, or possibly, neatly done up in an eel skin. To keep this effect the pigtail or clubbed hair was tarred. To protect the collar of the uniform from being stained by the tar from his pigtail, the bluejacket wore a bandanna. The collar was often ornamented according to the personal taste of the man who wore it. Sailors have from time immemorial been fond of ornamentation, and fanciful designs appeared on the collars of their jackets in the early days. Possibly, some individual acquired the habit of adorning his uniform with tape around the outer edge of the collar; the style was admired by others and gradually spread until it has become a regulation accepted by most navies.

Stripes and stars were first officially authorized in 1866. The practice of sewing three rows of tape on the collar was no doubt selected for decorative effect and has no special significance, tradition to the contrary notwithstanding. It had not, as has been often explained, its origin in any desire to commemorate the three famous sea victories of Great Britain's Lord Nelson. The two stars on the collar appear to have no symbolism.

The use of stripes on the cuffs of jumpers was also first authorized in 1866; one or more stripes being prescribed to indicate petty officers and nonrated men. When new dress jumpers, mentioned above, appear they will have plain coat-type cuffs.

Neckerchiefs

In "pigtail" days, no doubt the black neckerchief was used in an attempt to maintain some semblance of cleanliness. Hence, it was worn around the neck, thus protecting the collar of the shirt or jumper. The pigtails were greasy, and black concealed the dirt. Possibly, the neckerchief was used in the capacity of a sweat rag as well, since it was also worn around the forehead. As was done on HMS *Berwick* in 1794 at the time of the captain's death, so at Nelson's funeral, the crew probably cut black neckerchiefs in two and wore them in mourning, one half around the arm, the other half around the hat. The tradition, that the black neckerchief was worn for the first time at Nelson's funeral and has since been adopted in commemoration of this great leader, is not based on fact. Silk ties, usually black, were worn by enlisted men in the United States Navy as early as 1776. The black silk neckerchief has been officially a part of the uniform of the enlisted men since 1841, at which time any mention of enlisted men's uniforms was first included in *Uniform Regulations*.

Bell-bottom Trousers

There were probably two reasons for bell-bottom trousers—both excellent ones. First it was much easier with the bell-bottoms to roll up the trousers when washing down decks or working in wet weather; second, if, by chance, a sailor found himself overboard it was much easier to kick these hampering garments from his legs, if the bottoms were wide. The square flap which is buttoned in front at the waistband was also designed in such a way as to enable a man overboard to remove his trousers quickly. With one quick yank the flap could be torn loose. If there is any significance in the number of buttons—thirteen—it has never been officially explained. A recently approved change in enlisted men's blue uniforms abolishes this type of trousers but the present type will probably continue to be used for several years.

Cap Ribbons

The inclusion, in the uniform, of cap ribbons was more for the pleasure of personal adornment than for any reason of utility. The United States Navy long ago abolished long flowing cap ribbons and tied them neatly in a bow on the left side.

The addition in peacetime of the name of the ship in letters of gold was of later origin than the ribbons. It has become standard practice in nearly all navies of the world. At the present time, the only lettering authorized on the cap ribbon is U. S. NAVY or U. S. NAVAL RESERVE.

Purpose of Uniform

The uniform promotes a feeling or state of unity, while adding smartness to the appearance of an individual or a group. It serves to point out a friend or enemy. Insignia worn according to regulations upon the uniform indicate corps, rank, rate, and specialty as well as other distinguishing features, such as awards, campaign ribbons, and service stripes. Furthermore, the uniform makes it possible to discriminate readily the position of a superior, thus facilitating the rendition of correct recognition.

It would be fitting, in closing this chapter, to quote from a recent address delivered to a group of midshipmen at their graduation:

"Have an exalted pride in the uniform you wear and all that it represents. Wear it correctly; wear it proudly. Salute it with respect when you meet it; behave in it in a seemly manner; protect it when it is offended or in danger. It represents the fleet, the nation, your home, and your family. It is a symbol of all that is dear to you and of all that men are willing to die for."

CHAPTER 9

THE NAVAL ESTABLISHMENT

ORGANIZATION FOR NATIONAL SECURITY

Introduction

The primary purpose of this chapter is to present an organizational picture of the Naval Establishment. In order to do that, it is first necessary to show the place of the Naval Establishment in the Organization for National Security. (See Chart I.)

To assist the President of the United States in the discharge of his broad responsibility for national security, the National Security Act of 1947 created the National Security Council (including the Central Intelligence Agency) and the National Security Resources Board.

The National Military Establishment, headed by the Secretary of Defense, was created by the same law and includes three major operating components: the Department of the Army, the Department of the Air Force, and the Department of the Navy. Each is administered as an individual executive department under a Secretary appointed by the President with the consent of the Senate. The three departments, as integral parts of the National Military Establishment, are subject to the general direction, authority, and control of the Secretary of Defense, but the Secretary of each of the three departments retains the right of free access to the President.

In coordinating the three departments, the Secretary of Defense is assisted by the following agencies: the War Council, the Joint Chiefs of Staff, the Research and Development Board, and the Munitions Board.

A brief summary of the functions of the agencies mentioned above follows. Frequent reference to Chart I should be made in reading the remainder of this section on the Organization for National Security.

National Security Council

The National Security Council advises the President of the United States and reports directly to him regarding the integration of domestic, foreign, and military policies pertaining to national security. The President may assign additional duties to effect coordination among all government departments and agencies in security matters.

Membership includes, in addition to the President, the heads of departments and agencies primarily responsible for various aspects of national security. Hence, through its members, the National Security Council has access to a broad range of pertinent information. The analysis and correlation of this information and its orderly presentation for consideration by the Council are the function of the Council's Secretariat.

Central Intelligence Agency

The Central Intelligence Agency has as its general mission the coordinating of intelligence activities of departments and agencies concerned with national security. In accomplishing this mission it performs the following duties:

1. It advises the National Security Council concerning such intelligence activities of the government departments and agencies as relate to national security.
2. It recommends coordination of such intelligence to the Council.

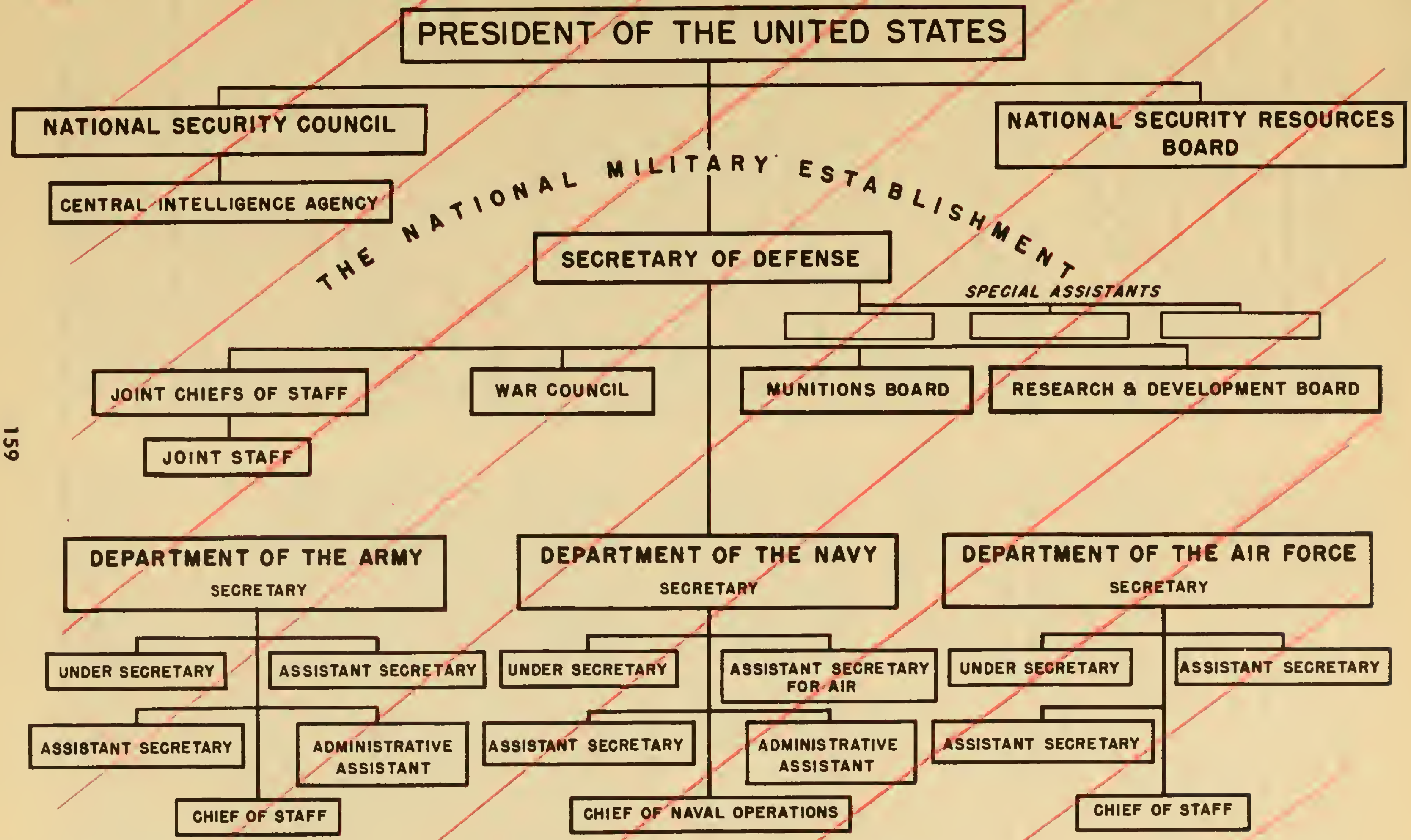

PRESIDENT OF THE UNITED STATES
NATIONAL SECURITY COUNCIL
CENTRAL INTELLIGENCE AGENCY
NATIONAL SECURITY RESOURCES BOARD
THE NATIONAL MILITARY ESTABLISHMENT
SECRETARY OF DEFENSE
SPECIAL ASSISTANTS
JOINT CHIEFS OF STAFF
JOINT STAFF
WAR COUNCIL
MUNITIONS BOARD
RESEARCH & DEVELOPMENT BOARD
DEPARTMENT OF THE ARMY
SECRETARY
UNDER SECRETARY
ASSISTANT SECRETARY
ASSISTANT SECRETARY
ADMINISTRATIVE ASSISTANT
CHIEF OF STAFF
DEPARTMENT OF THE NAVY
SECRETARY
UNDER SECRETARY
ASSISTANT SECRETARY FOR AIR
ASSISTANT SECRETARY
ADMINISTRATIVE ASSISTANT
CHIEF OF NAVAL OPERATIONS
DEPARTMENT OF THE AIR FORCE
SECRETARY
UNDER SECRETARY
ASSISTANT SECRETARY
ASSISTANT SECRETARY
CHIEF OF STAFF

Chart 1—ORGANIZATION FOR NATIONAL SECURITY

3. It performs intelligence services where this can be done more efficiently on a centralized basis.

4. It correlates and evaluates intelligence affecting national security and provides for appropriate dissemination of such intelligence within the Government.

National Security Resources Board

In the event of war, the National Security Resources Board is the main coordinating agency between military demands and civilian requirements for manpower, resources, and productive facilities. Its broad field covers the mobilization and utilization of all national resources in case of war and balancing of the requirements of the National Military Establishment against essential civilian needs. The National Security Resources Board reports to the President and advises him concerning the coordination of military, industrial, and civilian mobilization.

Membership consists of the chairman (appointed from civilian life by the President, with Senate approval) and heads of departments and agencies as designated by the President. Among these are the secretaries of the following departments: Treasury, Defense, Interior, Agriculture, Commerce, and Labor.

National Military Establishment

The Secretary of Defense is a member of the President's Cabinet and is his principal assistant in all matters relating to national security. He is responsible for general policies and programs for the National Military Establishment; for general direction, authority, and control over the Military Establishment; and for supervision and coordination of budget estimates and programs. He is also required to take appropriate steps to eliminate unnecessary duplication or overlapping between the three deartments—Army, Navy, and Air Force. The National Security Act in its declaration of policy states in part that it is the intent of Congress "to provide for their authoritative coordination and unified direction under civilian control but not to merge them."

War Council

The War Council performs in the National Military Establishment for the Secretary of Defense in much the same manner that the National Security Council does for the President. The Council advises the Secretary of Defense on matters of broad policy relating to the Armed Forces, and considers and reports on such other matters as he directs.

In addition to the Secretary of Defense who is Chairman and has the power of decision, the membership of the War Council consists of the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force; the Chief of Staff, United States Army; the Chief of Naval Operations; and the Chief of Staff, United States Air Force.

Joint Chiefs of Staff

The Joint Chiefs of Staff are basically responsible for military strategy and the preparation of strategic and logistic plans. They are also responsible for the assignment of logistic responsibilities to the Military Services, the establishment of unified commands, and the formulation of policies for joint training and for coordination of the education of members of the Military Forces. They are assisted by a Joint Staff, membership of which is restricted to not more than a hundred officers whose numbers are divided approximately equally among the three Armed Services.

The Joint Chiefs of Staff act as the principal military advisers to the President and to the Secretary of Defense. They are: Chief of Staff, United States Army; Chief of Naval Operations; Chief of Staff, United States Air Force; and the Chief of Staff to the Commander in Chief, if there be one.

Munitions Board

The Munitions Board is basically responsible for coordinating the procurement, production, and distribution plans of the departments and agencies of the Military Establishment; the assignment of procurement responsibilities; liaison with other departments and agencies of the Government for the proper correlation of military requirements with the civilian economy, particularly in regard to critical materials. Here are coordinated the logistic plans of the Joint Chiefs of Staff, detailed material requirements as determined by each department in support of those plans, and first-hand knowledge of the nation's industrial potential.

The Munitions Board serves as the coordinating agency within the Military Establishment for official communications to and from the National Security Resources Board; from the Munitions Board comes much of the basic data needed by the National Security Resources Board in the discharge of its broader responsibility to the President.

The Chairman of the Munitions Board is appointed by the President from civilian life. Other members are an Under Secretary or Assistant Secretary from each of the three military departments.

Research and Development Board

The Research and Development Board is the overall planning and coordinating agency in the field of research and development for military purposes. It assists the Secretary of Defense in assuring adequate provision for research and development in the interest of national security. This Board works in close relation with the Joint Chiefs of Staff in order to correlate research and development with strategic and logistic plans; and with the Munitions Board in order that the latter may be kept informed of the requirements for materials, components, and production facilities needed to carry out research and development programs.

The chairman, a civilian, is appointed by the President, with the approval of the Senate; other members are two representatives from the Departments of the Army, Navy, and Air Force.

THE NAVAL ESTABLISHMENT

Major Divisions

Geographically as well as organizationally the Department of the Navy, referred to as the Naval Establishment, consists of three principal parts:

1. *The Navy Department*: The Navy Department is the executive part of the Naval Establishment located at the seat of the Government, and comprises the bureaus, boards, and offices of the Navy Department; the Headquarters of the Marine Corps; and the Headquarters of the Coast Guard (when assigned to the Navy).
2. *The Shore Establishment*: The Shore Establishment comprises the field activities of the Navy Department which are distributed throughout the United States and outlying territories to service, maintain, supply, equip, repair, and perform similar functions in support of the Operating Forces.
3. *The Operating Forces*: The Operating Forces may be defined as the several fleets, seagoing forces, sea frontier forces, district forces, and such of the shore activities and other forces and activities as may be assigned to the Operating Forces by the President or the Secretary of the Navy.

It should be noted that while the Naval Establishment does, as indicated above, fall into three principal parts, the Navy Department and the Shore Establishment exist solely to serve and support the Operating Forces. Basically, it is the intent of this presentation to disclose the way in which these fleet support activities are organized and how they operate in performance of their mission. Chart II shows an overall picture and picks out the lines of authority and control which knit together the Operating Forces, the Navy Department, and the Shore Establishment, making a cohesive whole of the Naval Establishment.

Background and Development

The present organization of the Department of the Navy is the result of a continuous orderly growth. When the country was young, the Navy was small and it was a comparatively simple matter to provide for its maintenance. Ships were constructed according to general designs that were centuries old, and ordnance was extremely primitive.

As technical advances occurred, and as the race for naval supremacy progressed, the department gradually expanded until it assumed its present system of organization. The history of the department will not be related in detail here, but a few outstanding events will illustrate its process of evolution.

For the greater period of the time between the Revolutionary War and 1798, control of the Navy was exercised by Congress through its Marine Committee, but for a short time during the latter part of this period the Secretary of War exercised control of both the Army and Navy. The Constitution (1789) provides that Congress should have the power "to provide and maintain a Navy" and "to make rules for the government and regulation of the land and naval forces"; and names the President as Commander-in-Chief of the Army and Navy.

In ~~1789~~ 1798, the Congress established the Department of the Navy with the Secretary of the Navy as its head.

From 1815 to 1842, a board of three Navy Commissioners aided the Secretary in the administration of the department. In 1842, the bureaus were established by statute which provided that the business of the department should be distributed among them in such manner as the Secretary of the Navy should judge to be expedient and proper. The original bureaus set up in 1842 were the Bureau of Navy Yards and Docks; the Bureau of Construction, Equipment, and Repair; the Bureau of Provisions and Clothing; the Bureau of Ordnance and Hydrography; and the Bureau of Medicine and Surgery.

The Office of the Assistant Secretary of the Navy was established for a temporary period from 1861 to 1869, and was reestablished in 1890.

In 1915, the Congress provided for the Office of Naval Operations, headed by the Chief of Naval Operations, who was to be charged, under the direction of the Secretary of the Navy, with the operation of the fleet and with the preparation and readiness of the plans for its use in war.

In 1921, Congress set up a separate Bureau of Aeronautics, and several years later (1926) provided for an Assistant Secretary of the Navy for Air.

By statute enacted in 1940, the Office of the Under Secretary of the Navy was authorized during any national emergency. The Under Secretary of the Navy performs such duties as may be prescribed by the Secretary of the Navy and is next in succession to the Secretary during his absence or disability.

It is the purpose of the department to supervise and maintain a naval establishment in readiness for the performance of such duties as the President, who is Commander in Chief, may order. The fundamental naval policy of the United States is to maintain the Navy as a thoroughly integrated entity in sufficient strength on the sea and in the air to uphold, in conjunction with our other Armed Forces, our national policies and interests, to support our commerce, and to guard the United States, including its overseas possessions and dependencies.

Executive Organization

In this summary discussion of the over-all operating organization of the Naval Establishment, frequent reference to Chart II will be helpful in acquiring a general understanding of the operation of the Naval Establishment as a whole. The final three sections of this chapter are concerned with a more detailed discussion of the three principal parts of the Naval Establishment—the Navy Department, the Shore Establishment, and the Operating Forces.

Under the supervision and direction of the Secretary of the Navy, the Naval Establishment is administered by him as an independent executive department of the United States Government, subject to the general direction, authority, and control of the Secretary of Defense.

The Secretary of the Navy is assisted by the civilian executive assistants and by the naval professional assistants.

The civilian executive assistants are the Under Secretary, the Assistant Secretary for Air, the Assistant Secretary, and the Administrative Assistant to the Secretary. Their duties in general involve directing and improving the work of the Navy Department and the Shore Establishment in fulfilling their mission of supporting the Operating Forces.

The naval professional assistants, who have full authority over matters inherent in naval administration and command, fall into two categories: the naval command assistant who is the Chief of Naval Operations; and the naval technical assistants who include the Chiefs of Bureaus, the Commandant of the Marine Corps, the Judge Advocate General, the Chief of Naval Research, the Chief of Naval Material, and the Commandant of the Coast Guard (when that organization is assigned to the Department of the Navy).

General Responsibilities of the Executive Organization

The broad responsibilities of the Naval Establishment and hence of the Secretary and of his civilian executive and naval professional assistants are best summarized by the following statement of fundamental naval policy:

> To maintain the Navy and Marine Corps, as a part of the National Military Establishment, in sufficient strength and readiness to fulfill its responsibilities as set forth in the National Security Act of 1947 and the "Functions of the Armed

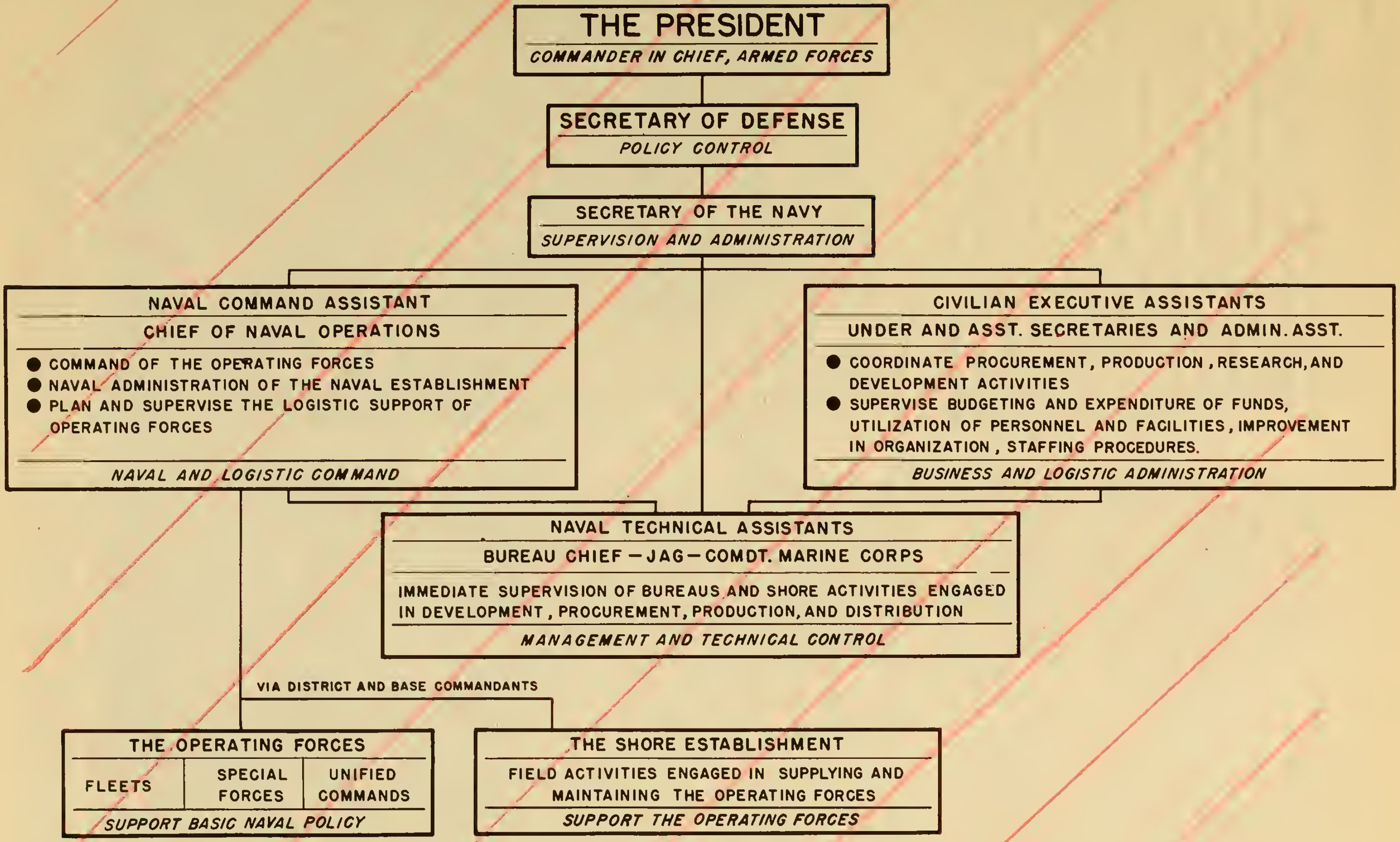

THE PRESIDENT
COMMANDER IN CHIEF, ARMED FORCES
SECRETARY OF DEFENSE
POLICY CONTROL
SECRETARY OF THE NAVY
SUPERVISION AND ADMINISTRATION
NAVAL COMMAND ASSISTANT
CHIEF OF NAVAL OPERATIONS
● COMMAND OF THE OPERATING FORCES
● NAVAL ADMINISTRATION OF THE NAVAL ESTABLISHMENT
● PLAN AND SUPERVISE THE LOGISTIC SUPPORT OF OPERATING FORCES
NAVAL AND LOGISTIC COMMAND
CIVILIAN EXECUTIVE ASSISTANTS
UNDER AND ASST. SECRETARIES AND ADMIN. ASST.
● COORDINATE PROCUREMENT, PRODUCTION, RESEARCH, AND DEVELOPMENT ACTIVITIES
● SUPERVISE BUDGETING AND EXPENDITURE OF FUNDS, UTILIZATION OF PERSONNEL AND FACILITIES, IMPROVEMENT IN ORGANIZATION, STAFFING PROCEDURES.
BUSINESS AND LOGISTIC ADMINISTRATION
NAVAL TECHNICAL ASSISTANTS
BUREAU CHIEF—JAG—COMDT. MARINE CORPS
IMMEDIATE SUPERVISION OF BUREAUS AND SHORE ACTIVITIES ENGAGED IN DEVELOPMENT, PROCUREMENT, PRODUCTION, AND DISTRIBUTION
MANAGEMENT AND TECHNICAL CONTROL
VIA DISTRICT AND BASE COMMANDANTS
THE OPERATING FORCES
FLEETS
SPECIAL FORCES
UNIFIED COMMANDS
SUPPORT BASIC NAVAL POLICY
THE SHORE ESTABLISHMENT
FIELD ACTIVITIES ENGAGED IN SUPPLYING AND MAINTAINING THE OPERATING FORCES
SUPPORT THE OPERATING FORCES

Chart II—THE NAVAL ESTABLISHMENT

Forces and the Joint Chiefs of Staff" issued by the Secretary of Defense on 21 April 1948.

Four basic tasks evolve from the above statement of fundamental naval policy: policy control, naval command, logistics administration and control, and business administration. The responsibility for these four tasks has been divided among the Secretary, his civilian executive assistants, and naval professional assistants.

Policy control is the task of interpreting, applying, and upholding national policies and interests in the development and use of the Naval Establishment. This encompasses the broadest concept of public relations which extends to such vital relationships as those with Congress, the President, the Secretary of Defense, public information media, and private concerns.

The task of policy control has been retained by the Secretary as his prime responsibility since on him rests the final accounting for the results of the work and efforts of the entire Naval Establishment. He is assisted and advised by his executive organization in formulating and administering guiding policies.

Naval command is in general the task of commanding the Operating Forces and maintaining them in a state of readiness to conduct war. Naval command deals broadly with the conduct of all who wear the naval uniform and assumes full control of such personnel and their duties when they are serving with the Operating Forces. It also includes the promulgation of directives throughout the Naval Establishment on matters pertaining to naval operations, security, intelligence, discipline, communications, and similar functions of a military character.

The task of naval command is assigned to the Chief of Naval Operations (CNO) since he is, by training and experience, best fitted to discharge this great responsibility.

Logistics administration and control involve coordinating and directing the efforts of the Navy Department and the Shore Establishment to assure development, procurement, production, and distribution of materials, facilities, and personnel to the Operating Forces. This task has two phases: *consumer logistics* and *producer logistics.*

Consumer logistics, which involves planning and forecasting the personnel and material needs of the Operating Forces and distribution to meet those needs, is the responsibility of CNO. Producer logistics, the task of developing and procuring the requirements of the Operating Forces from the standpoint of the producer (the Navy Department and the Shore Establishment), and the provision of services necessary to maintain them, is assigned to the civilian executive assistants.

Business administration refers to the task of business management of the Naval Establishment and concerns specifically the developing and maintaining of economy and efficiency in such matters as organization, staffing, utilization of personnel, material, and facilities, the budgeting and expenditure of funds, and so on.

The duties of business administration are assigned to the civilian executive assistants. Their responsibilities extend directly over bureaus and offices of the Navy Department, and through them, to the field activities comprising the Shore Establishment. In regard to the Operating Forces, they collaborate with and assist the Chief of Naval Operations in evaluating and improving business administration therein.

Thus we see that the four basic tasks of the executive organization have been divided among the Secretary and his civilian executive and naval professional assistants in accordance with their experience and training. In this way, the public interest is served by a form of organization that provides for full participation by both naval and civilian executives according to their normal training, experience, and abilities.

THE NAVY DEPARTMENT

Function and Over-all Composition

The Navy Department, located in Washington, D. C., is the headquarters agency, the home office of the Naval Establishment, from which stem the over-all policy, administrative, command, and logistic direction to the Operating Forces and the Shore Establishment. The Navy Department (see Chart III) is essentially made up of the Office of the Secretary, the Office of the Chief of Naval Operations, the offices of the civilian executive assistants, and the bureaus and offices, including the Headquarters of the Marine Corps, headed by the naval technical assistants.

The various boards and offices reporting to, and performing staff functions and services for the Secretary and his civilian executive assistants are collectively referred to as the Executive Office of the Secretary (EXOS). Administratively they are treated as a single organizational entity of the Navy Department.

Secretary of the Navy

The Secretary of the Navy is responsible to the Secretary of Defense and the President for the supervision of all naval matters. His immediate responsibilities are policy control, relations with the public, morale and welfare of the Navy, and immediate supervision of the General Board, the Office of Public Relations, and Navy participation in the Military Liaison Committee to the Atomic Energy Commission.

Although the Secretary has delegated a great deal of his authority for direct action, he has retained the essentials that assure that the continuity of effort throughout the entire department is maintained. It is a sound organization and executive management principle that only those matters of a broad and inclusive nature which affect all parts of the organization be reported directly to the responsible head. The fallacy of assuming too much direct control of specific functions not necessarily common to all efforts has been

NAVY DEPARTMENT BUILDING ON HISTORIC CONSTITUTION AVENUE, WASHINGTON, D.C.
Several boards, bureaus, and offices of the Navy Department are housed in this building. Some offices, including that of the Secretary of the Navy have moved from this location to the Pentagon, headquarters of the National Defense organization.

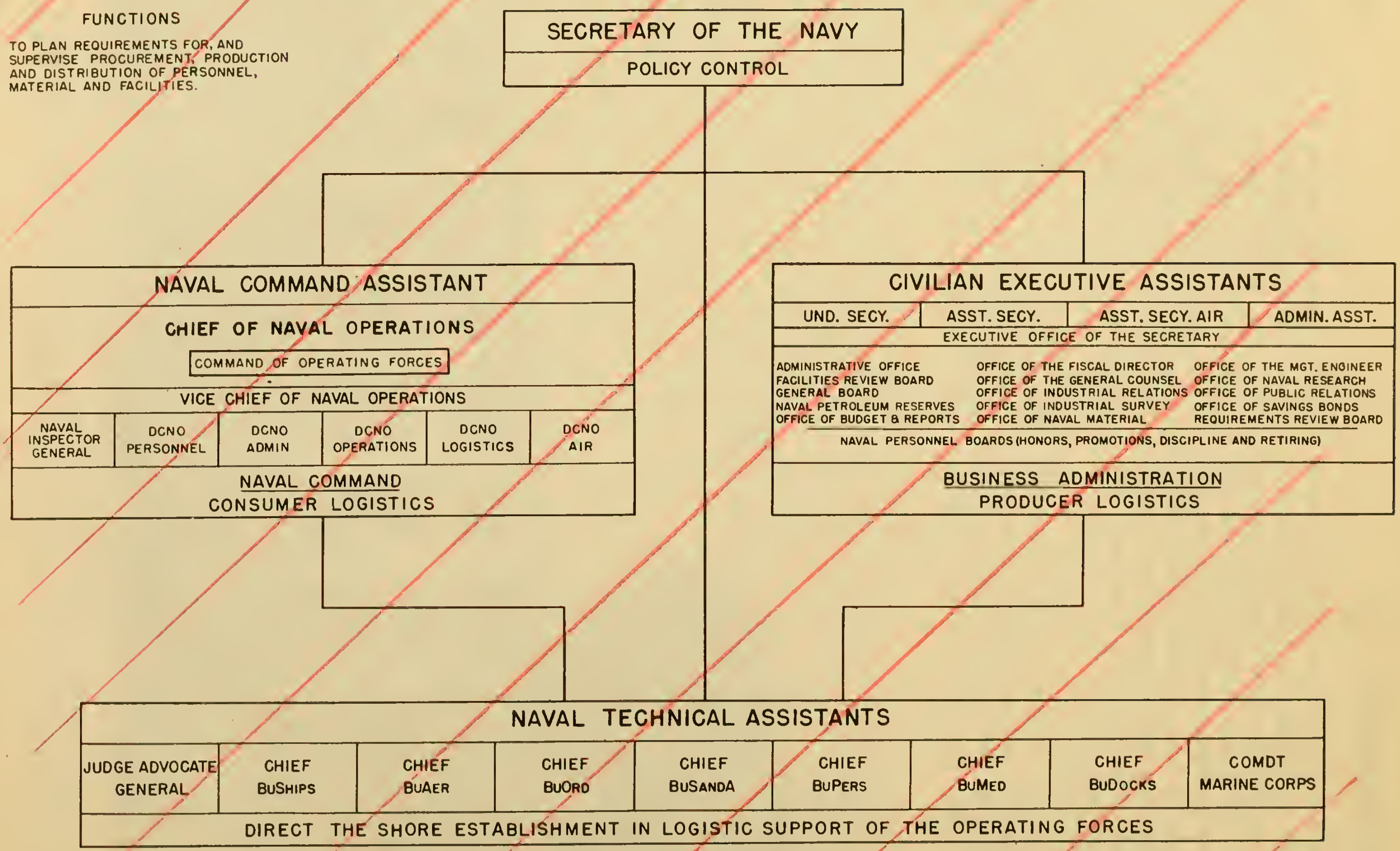

FUNCTIONS
TO PLAN REQUIREMENTS FOR, AND SUPERVISE PROCUREMENT, PRODUCTION AND DISTRIBUTION OF PERSONNEL, MATERIAL AND FACILITIES.
SECRETARY OF THE NAVY
POLICY CONTROL
NAVAL COMMAND ASSISTANT
CHIEF OF NAVAL OPERATIONS
COMMAND OF OPERATING FORCES
VICE CHIEF OF NAVAL OPERATIONS
NAVAL INSPECTOR GENERAL
DCNO PERSONNEL
DCNO ADMIN
DCNO OPERATIONS
DCNO LOGISTICS
DCNO AIR
NAVAL COMMAND
CONSUMER LOGISTICS
CIVILIAN EXECUTIVE ASSISTANTS
UND. SECY.
ASST. SECY.
ASST. SECY. AIR
ADMIN. ASST.
EXECUTIVE OFFICE OF THE SECRETARY
ADMINISTRATIVE OFFICE
FACILITIES REVIEW BOARD
GENERAL BOARD
NAVAL PETROLEUM RESERVES
OFFICE OF BUDGET & REPORTS
OFFICE OF THE FISCAL DIRECTOR
OFFICE OF THE GENERAL COUNSEL
OFFICE OF INDUSTRIAL RELATIONS
OFFICE OF INDUSTRIAL SURVEY
OFFICE OF NAVAL MATERIAL
OFFICE OF THE MGT. ENGINEER
OFFICE OF NAVAL RESEARCH
OFFICE OF PUBLIC RELATIONS
OFFICE OF SAVINGS BONDS
REQUIREMENTS REVIEW BOARD
NAVAL PERSONNEL BOARDS (HONORS, PROMOTIONS, DISCIPLINE AND RETIRING)
BUSINESS ADMINISTRATION
PRODUCER LOGISTICS
NAVAL TECHNICAL ASSISTANTS
JUDGE ADVOCATE GENERAL
CHIEF BuSHIPS
CHIEF BuAER
CHIEF BuORD
CHIEF BuSANDA
CHIEF BuPERS
CHIEF BuMED
CHIEF BuDOCKS
COMDT MARINE CORPS
DIRECT THE SHORE ESTABLISHMENT IN LOGISTIC SUPPORT OF THE OPERATING FORCES

Chart III—THE NAVY DEPARTMENT

avoided in the delegation of responsibilities with attendant authority, referred to previously as having been assigned to the civilian and naval assistants.

Following this principle, those duties and responsibilities enumerated below under the headings of Under Secretary, Assistant Secretary, Assistant Secretary for Air, and Administrative Assistant to the Secretary, while remaining the basic responsibility of the Secretary, have been so delegated. It is pointed out that such delegation is not fixed nor do the attendant responsibilities remain fixed with the office. Rather, the assignment is changed and varied to reflect the abilities and specialties of the incumbents or to adapt it to any changes in conditions or policies which may occur.

Civilian Executive Assistants

Under Secretary of the Navy. The Under Secretary is delegated the responsibility for collaborating with the other civilian executive assistants and CNO to assure coordination of their work and also to assure sound business administration. His responsibilities include procurement and administration of civilian personnel, certain legislative and legal matters, collaboration with other government agencies, and immediate supervision of the Office of the Judge Advocate General, Office of Industrial Relations, Naval Petroleum Reserves, and of Navy participation in the Munitions Board and State-Army-Navy-Air Force Coordinating Committee.

Assistant Secretary of the Navy for Air. The Assistant Secretary for Air has responsibility for such matters as supervision of naval aeronautics and its coordination with other government agencies; certain phases of logistics administration and control that pertain to programming and correlation of research, experimental, test, and development activities; and naval personnel matters. He supervises Navy participation in the Air Coordinating Committee, and the Research and Development Board; the Office of Naval Research; and naval personnel boards dealing with honors, promotions, discipline, and retirement.

Assistant Secretary of the Navy. The Assistant Secretary is delegated responsibility for certain phases of logistics administration and control, general supervision of the preparation of the budget, and legal matters relating to procurement and disposition of material. Among the activities that he supervises are the Office of Budget and Reports, Office of Naval Material, and Office of the General Counsel.

Administrative Assistant to Secretary of Navy. The post of Administrative Assistant was created early in 1947 in line with the Navy Department's aim to provide continuity in the otherwise shifting population therein. He is delegated the responsibility for general supervision of the accounts relating to the fiscal affairs of the Naval Establishment, and the responsibility for administrative matters in the Executive Office of the Secretary. He supervises the Office of the Fiscal Director, the Office of the Management Engineer, and the Administrative Office of the Navy Department.

Each of the civilian executive assistants are, in addition to the duties described above, required to exercise general supervision of the bureaus and of Headquarters, Marine Corps, within the prescribed areas of the above assignment; review and evaluate the compliance of the bureaus and offices and of the Shore Establishment with established policies, procedures, and with sound business administration practice, and issue such orders as are required to assure compliance therewith; collaborate with the Chief of Naval Operations in reconciling difficulties encountered in meeting the requirements of the Operating Forces due to scarcities of funds, material, products, facilities, or personnel.

Naval Professional Assistants

The naval professional assistants are, as stated previously, divided into two categories—the naval command assistant (CNO) and the naval technical assistants.

Naval Command Assistant. The naval command assistant, the Chief of Naval Operations, is the top ranking officer of the Navy. He is principal naval advisor to the President and to the Secretary of the Navy on the conduct of war, and the principal naval advisor and naval executive to the Secretary on the conduct of activities of the Naval Establishment. He recommends to the President and Congress the size of the Operating Forces necessary to fulfill the Navy's role in support of the strategic plans of the Joint Chiefs of Staff. On determination of the size of the Operating Forces, he distributes the workload in terms of its logistic requirements among the bureaus and offices of the Navy Department.

To assist the Chief of Naval Operations there are a Vice Chief of Naval Operations (VCNO), not more than six Deputy Chiefs of Naval Operations (DCNO), such Assistant Chiefs of Naval Operations (ACNO) as considered necessary by CNO (and approved by the Secretary), and a Naval Inspector General. A brief statement of their duties follows:

Vice Chief of Naval Operations. Under the Vice Chief of Naval Operations is a staff organization, the General Planning Group, whose basic function is to coordinate the planning and programming functions of the Deputy Chiefs, thus integrating the staff work on over-all problems. Their further duty is to advise, recommend, and aid in drawing up broad strategical plans, developing the logistics requirements in support of them, based on over-all plans received from the Joint Chiefs of Staff. This group is also responsible for the same aspects of plans which CNO recommends to the Joint Chiefs of Staff for review and action. The Vice Chief, in his capacity as principal assistant, acts as the medium through which directives and policies are funnelled to the Deputy Chiefs, of whom there are five at present. The DCNO's are required to report directly to CNO as well as through VCNO.

Deputy Chiefs of Naval Operations. The DCNO (Personnel) coordinates basic training activities and has responsibility for developing personnel logistics plans and policies.

DCNO (Administration) exercises supervision over Naval Communications, the Hydrographic Office, and the Naval Observatory. He is responsible for all general administrative matters in the Office of CNO and is also charged with the responsibility for directing Naval Missions and Pan-American affairs. Island governments and naval district administrative affairs are under his supervision.

DCNO (Operations) has as his basic duty the formulation of strategical plans and policies. He collects, evaluates, and disseminates operational information covering fleet activities and has direct cognizance of the organization, readiness, administration, and operations of the seagoing forces, the sea frontiers, and the overseas naval command areas. His responsibility also includes the direction and supervision of the Office of Naval Intelligence.

DCNO (Logistics) has as his direct responsibility the preparation of plans and policies for the logistic requirements of the Operating Forces. He coordinates and directs the efforts of the bureaus in the execution of those plans broadly covering the problem of consumer logistics, with the exception of the duties specifically assigned to the DCNO (Air) who has parallel responsibilities within that specific field.

DCNO (Air) responsibilities include, besides the military aspects of naval aviation, over-all planning for the air arm, establishing of policies and determination of logistic requirements for support, the further responsibility for integration of Marine Corps aviation within and as a part of the over-all naval aviation program.

Naval Inspector General. The Naval Inspector General reports directly to the Chief of Naval Operations. He makes inquiry and reports on matters affecting the discipline and military efficiency of the Naval Establishment as directed by the Secretary or CNO. All parts of the Naval Service are open to his scrutiny and he has broad latitude in the discharge of his duties.

Naval Technical Assistants. The naval technical assistants, as previously mentioned, are the Chiefs of Bureaus, the Commandant of the Marine Corps, the Judge Advocate General, the Chief of Naval Research, the Chief of Naval Material, and the Commandant of the Coast Guard.

Subject to the supervision and direction of the civilian executive assistants, the naval technical assistants are responsible for providing the logistic support requirements of the Operating Forces. Their organizations include both the bureaus and offices they head in the Navy Department and the activities of the Shore Establishment assigned to those bureaus and offices. They also act as technical advisors in their special fields to the Secretary, the civilian executive assistants, and CNO (the naval command assistant).

The bureaus and offices headed by the naval technical assistants (excepting the Commandants of the Marine Corps and Coast Guard) are discussed in the following section. The Marine Corps and the Coast Guard are described in Chapters 27 and 26 respectively.

BUREAUS AND OFFICES OF THE NAVY DEPARTMENT

General

The bureaus of the Navy Department control, direct, supervise, and assign the workload, and schedule performance of the Shore Establishment assigned to their cognizance, and provide thereby the material support for the Operating Forces. Such operations conform to the over-all assignment of work requirements as directed by CNO, in accordance with the policies as established by the Secretary of the Navy and in conformity with the administrative procedures developed and projected by the civilian executive assistants.

Four of the bureaus—Ships, Ordnance, Yards and Docks, and Aeronautics—are considered the material bureaus. They perform primarily procurement functions. The Bureau of Supplies and Accounts also performs certain procurement functions and in addition performs disbursing and accounting functions for the entire Navy. The Bureau of Medicine and Surgery and the Bureau of Naval Personnel render services to the Naval Establishment as a whole.

Bureau of Ships (BuShips)

The Bureau of Ships performs the functions of the old Bureau of Construction and Repair and Bureau of Engineering.

The general design, structural strength, stability, and seaworthiness of naval vessels are responsibilities of the Bureau of Ships. Its duties also extend to maintenance, repair, alteration, and modernization or conversion of hull and machinery, including related equipment used for the propulsion of naval vessels, district craft (except for those under cognizance of the Bureau of Yards and Docks), and small boats.

BuShips has cognizance of auxiliary machinery, including pumps, distilling, refrigeration, and ventilating apparatus; and heating and piping systems. Sys-

DAVID TAYLOR MODEL BASIN, CARDEROCK, MARYLAND
Established primarily for testing ship models, the Model Basin now has a wind tunnel for studying the aerodynamics of flight.

tems for the generation and distribution of electrical power; interior communication systems; radar, radio, and sound equipage; experimental diving units, diving gear, and respiratory apparatus—all such gear are responsibilities of BuShips.

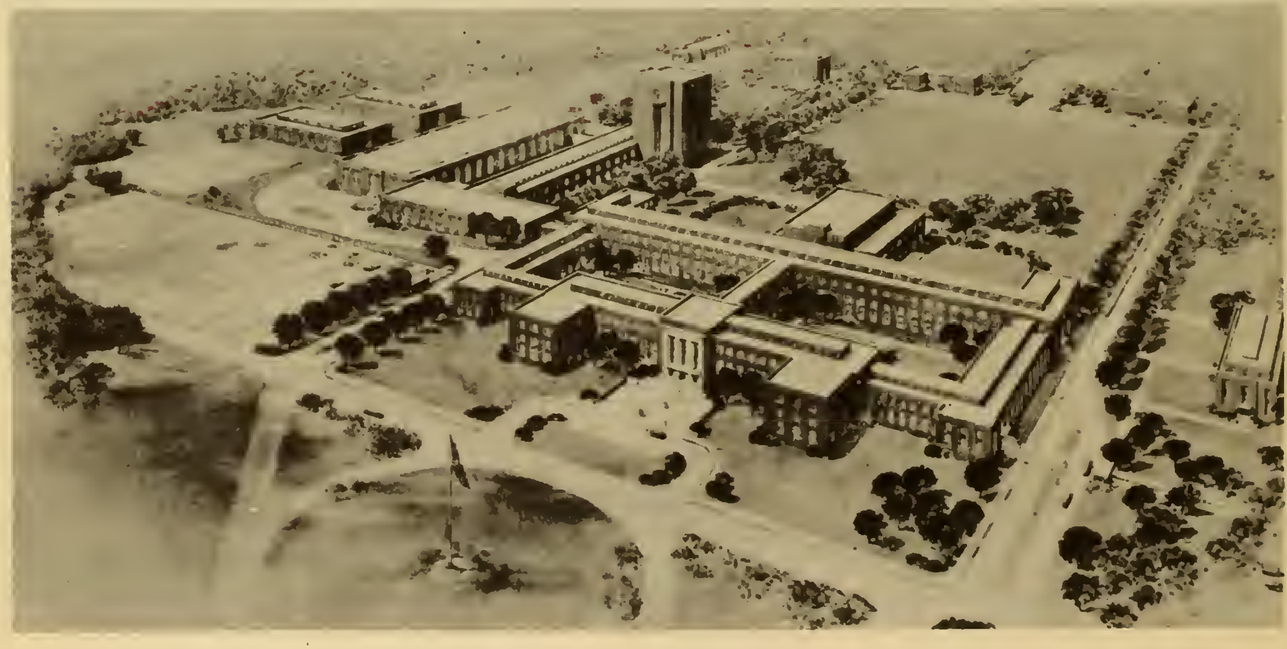
To keep abreast of the rapid strides in scientific development, the Bureau of Ships maintains several experiment laboratories. One of the best known is the David Taylor Model Basin, originally established in 1898 at the Washington Navy Yard and now located in Carderock, Maryland.

The father and guiding genius of the Model Basin, the finest plant of its kind in the world, was the late Rear Admiral David W. Taylor. It was established primarily to determine the best underwater forms for the hulls of ships, but from the beginning it performed a great deal of contributory research on hydrodynamics, ship construction, and ship propulsion. Some of the work done at the Model Basin in its early days is classic in the fields of naval architecture and marine propulsion. Here, on a miniature ocean, new inventions, improvements, and tactics are tested before being used in actual conflict. Models are given a thorough testing and, if necessary, the plans are revised in accordance with these tests so that the completed vessel will give the most satisfactory performance. With the advent of aircraft, the Model Basin undertook the construction and operation of the country's first wind tunnel for studying the aerodynamics of flight.

Other laboratories under the cognizance of BuShips are the Naval Engineering Experiment Station, the Naval Turbine and Boiler Laboratory, and other naval materials testing laboratories at naval shipyards where paints, rubber products, rope and chain are tested and developed.

Bureau of Ordnance (BuOrd)

The Bureau of Ordnance is charged with and responsible for the design, procurement, manufacture, maintenance, repair, alteration, and material effectiveness of naval ordnance; for related research and all pertinent functions, including the control of storage and terminal facilities for, and the storage and issue of ammunition and ammunition details. It is charged with the upkeep and operation of the following naval ordnance establishments: gun factories, ordnance



ARTIST'S CONCEPTION OF NAVAL ORDNANCE LABORATORY, WHITE OAK, MARYLAND
Covering 1000 acres, the Naval Ordnance Laboratory conducts research and development in all phases of naval ordnance.

NAVAL ORDNANCE TEST STATION, INYOKERN, CALIFORNIA

The large building in the foreground is the Michelson Laboratory, where developing and testing of rockets are carried on. The Ordnance Test Station conducts research and development work in all phases of naval ordnance but emphasis here is on rockets, guided missiles, aviation and underwater ordnance.

plants, torpedo stations, proving grounds, powder factories, ammunition depots, magazines on shore, mine depots, net depots, ordnance test stations, mine warfare test stations, ordnance laboratories, torpedo testing ranges, and degaussing and deperming stations.

The principal research and development activities of the Bureau of Ordnance are the Naval Ordnance Laboratory, White Oak, Maryland, and the Naval Ordnance Test Station, Inyokern, California. The Naval Ordnance Laboratory, established in 1929, conducts research and development in all phases of naval ordnance, including fire control, explosives, projectiles, ammunition, fuzes, and underwater ordnance.

Since 1944, construction has been underway at White Oak, Maryland, of the new laboratory, which will include 50 buildings containing more than $10,000,000 worth of modern technical instruments, and spreading over 938 acres of land. Among the special facilities of the laboratory are the reconstructed supersonic Kochel wind tunnel, a 20-million-volt betatron, nonmagnetic shops, controlled temperature plant, and equipment for simulating most of the sea conditions encountered in underwater ordnance.

The Naval Ordnance Test Station, purposely located in the Mojave Desert, conducts research and development and test work in all phases of naval ordnance, with emphasis on rockets, guided missiles, aviation ordnance, and underwater ordnance, with an additional function of furnishing primary training in the use of such weapons. It is the principal activity for short-range overland tests of guided missiles, and includes an Underwater Experimental Facility at Morris

Dam Reservoir. Started in early 1944, construction is still underway. The station has a population of more than 10,000 and covers 1,000 square miles of desert and mountain land; laboratory, shop, and office space totals 2,000,000 square feet; and the value of buildings and equipment is approximately $100,000,000. The new $10,000,000 Michelson Laboratory with its 250,000 square feet of floor space is the largest laboratory under one roof devoted to developing and testing of rockets and evaluating rocket propellants.

Bureau of Yards and Docks (BuDocks)

The duties of the Bureau of Yards and Docks comprise all that relates to the design and construction of public works and public utilities of the Naval Shore Establishment, and during wartime it supervises the construction of private plant facilities and extensions financed with naval funds. The scope of its functions includes structures and improvements located within the United States, in Alaska, various island possessions, in Panama, British islands in the Atlantic, and temporary advanced bases, wherever they may be.

Its work embraces such major engineering categories as drydocks, both graving and floating, marine railways, shipbuilding ways, harbor works, quay walls, piers, wharves, landings, dredging operations, floating and stationary cranes, power plants, fuel plants, fleet facilities, shops and industrial buildings, turret and erection shops, machine and electric shops, foundries, structural shops, and assembly and repair shops for aircraft. It also embraces naval supply depots, administration buildings, barracks and quarters, naval hospitals and dispensaries, refrigerating plants, ammunition storage plants, torpedo plants, Marine barracks, fuel storage plants and distribution, naval powder factories, heavier- and lighter-than-air facilities for aviation, aircraft overhaul and assembly plants, landing fields, radio stations, sewage disposal plants and distribution systems for heating, lighting, power, telephone, water, sewer and railroads, roads, water supply and sanitation.

The Bureau of Yards and Docks is charged with the maintenance and upkeep of the Naval Shore Establishment where such responsibility is not assigned by law to some other bureau. It is responsible for annual inspections and all major repairs of public works and public utilities; it designs and constructs all naval public works and public utilities after consulting as to their operating features with the bureau or office concerned.

"FIELD HOSPITAL" FOR NAVY SHIPS
Floating drydocks brought facilities for major ship repair almost into the combat zone during World War II and cut to a minimum the time which was needed for repairs. To the Bureau of Yards and Docks goes the credit for this new development in naval warfare.

BuDocks' responsibilities include the training, assignment, and work of the construction battalions, the Seabees (discussed in Chapter 26). It is responsible for the design, procurement, and assembly at ports of debarkation of all equipment necessary for the operations of naval construction battalions at advanced bases.

BuDocks has charge of the operation of power plants, transportation facilities, and weight-handling equipment at all activities maintained under its cognizance. It acquires real estate for the Navy and leased for naval purposes, and has custody of real estate not in active use.

Bureau of Aeronautics (BuAer)

The Bureau of Aeronautics makes recommendations to the Chief of Naval Operations as to the technical characteristics and limitations of naval aircraft, naval aviation equipment, and manufacturing sources therefor involved in the formulation of operating plans;

conducts research, makes tests, and participates with other government agencies and with industry in the design, development, and improvement of such aircraft and equipment; contracts for naval aircraft and aviation equipment of a technical, specialized nature; and provides for plant facilities as necessary to meet production programs.

BuAer schedules, in accordance with requirements, the production of naval aircraft and naval aviation equipment and assists manufacturers in such production, to insure that the various items may be delivered in the quantities, of the qualities, and at the time specified. Further, it collaborates with the Bureau of Yards and Docks in the design, construction, and alteration of all aeronautic shore establishments, and maintains and repairs such establishments. This bureau initially outfits and thereafter replenishes with aeronautical equipment and material all bases afloat and ashore from which naval aircraft operate, and supervises the service, repair, overhaul, and salvage of naval aircraft and aviation equipment.

BuAer provides and distributes, with minor exceptions, all photographic material for the Navy and for Marine Corps aviation activities.

The principal aeronautical field facilities under BuAer cognizance for testing and evaluating of its aircraft, guided missiles, and aviation equipment are the Naval Air Development Station at Johnsville, Pennsylvania, and the Naval Air Material Center at Philadelphia. Ground testing of equipment is done here and also certain developmental work with catapults, arresting gear, electronics, armament, and pilotless aircraft.

Another major field facility under BuAer is the Naval Air Test Center at Patuxent River, Maryland. Flight testing of piloted aircraft and components is carried on here. The facilities include a major flying field and overwater bombing and firing areas. At the Naval Air Missile Test Center, Point Mugu, California, flight testing and evaluation of guided missiles are conducted.

Bureau of Supplies and Accounts (BuSandA)

The Bureau of Supplies and Accounts (until 1892 known as the Bureau of Provisions and Clothing) is responsible for the procurement, custody, cataloging, inventory control, shipment, warehousing, issue, sale of, and accounting for, all supplies including food, fuel, clothing, general stores, and retail store stock and other property and services of the Navy. It is responsible for coordinating the Navy Supply System and for performing the supply functions within that system with the advice of the other bureaus.

In connection with fiscal matters, the Bureau of Supplies and Accounts is responsible for the procurement and disbursement of money for the Navy, the payment for material and services procured for the Navy, the control of the Naval Stock Fund, the Naval Working Fund, the Naval Procurement Fund, and the Clothing and Small Stores Fund.

It keeps money and property accounts for the Naval Establishment and performs cost inspection services under all types of contracts. It fixes the price at which material shall be expended from the Naval Stock Account, subject to the approval of the Secretary of the Navy.

The Bureau of Supplies and Accounts administers a centralized storage operating organization for the control of all storage facilities of the Naval Establishment. It is responsible for the preparation and service of food in all general messes except those at naval hospitals.

It authorizes and controls the transportation of Navy property and of authorized baggage of naval personnel, charters merchant vessels for transportation purposes, loads and unloads cargo ships and tankers, and procures and operates cargo terminal facilities.

The Bureau of Supplies and Accounts also prepares information and instructions regarding income tax for dissemination throughout the Naval Establishment.

Bureau of Medicine and Surgery (BuMed)

The Bureau of Medicine and Surgery (headed by the Surgeon General) is composed of appropriate administrative and professional divisions and is responsible for the maintenance of the health of the Navy and Marine Corps. Its duties include the care of its sick and injured, and the professional education and training of the officers, nurses, and men of the Medical Department. BuMed maintains health records of all officers and enlisted personnel of the Navy.

It provides for physical examination of officers, nurses, and enlisted personnel of the Navy and Ma-

NATIONAL NAVAL MEDICAL CENTER, BETHESDA, MARYLAND
Research in medicine is conducted at the Naval Medical Research Institute which is a part of the Medical Center. Animals used in the atomic explosion tests at Bikini were returned here for study.

rine Corps with a view to selection or retention of only those whose physical condition is such as to maintain or improve the military efficiency of the Service.

BuMed is also charged with the management and control of all naval hospitals, naval dispensaries, medical supply depots, naval base and fleet hospitals, medical laboratories, and of technical schools established for the education and training of members of the Medical Corps, Dental Corps, Medical Service Corps, and the Navy Nurses.

Every feature of the Navy which may possibly affect the health and well-being of its personnel are matters of concern to this bureau. It works in coordination with the Bureau of Ships in matters relating to the efficiency of hospital ships as regards the care of the sick and wounded. Within its province also are the sanitary features of ships being built; berthing, ventilation, and heating aboard ship; provisions for care of the wounded; and food, water, and clothing used by the Navy.

In medicine, as in other fields, the Navy has kept at least abreast of scientific progress. The two major research units of the Bureau of Medicine and Surgery are the Naval Medical Research Institute, Bethesda, Maryland; and the Naval Medical Research Laboratory at the Submarine Base, New London, Conn.

Established in 1942 as a part of the 248-acre Naval Medical Center, an organization that combines all the shore facilities and activities of the Medical Department, the Naval Medical Research Institute through its 17 research facilities conducts investigations and experimentations in a wide variety of scientific and medical fields. These include: chemistry, biophysics, pharmacology, toxicology, pathology, bacteriology, virology, and parisitology. The value of the Research Institute's buildings and laboratories, which are superbly equipped with almost every type of modern scientific instrument, is placed at almost $2,500,000.

In addition to the laboratories for the basic sciences, the Research Institute also has a nutrition laboratory, facilities for experimental surgery and dentistry, a laboratory for making artificial eyes from acrylic resins, an insectory for raising mosquitoes, a climatic laboratory to study the efficiency of personnel under environmental stress, a high-altitude chamber for the investigation of aviation problems, and a pressure chamber for studying various aspects of submarine medicine. Housing is provided for animals used for experimental purposes, including those placed on target ships at Bikini to determine the effects of ionizing radiations.

Some of the outstanding research developments credited to the Research Institute are as follows: an improved method of escape from a disabled submarine, an automatic photofluorographic camera for mass chest surveys for tuberculosis, an effective method for the desalination of sea water to aid shipwrecked personnel, a protective cream for prevention of flash burns, and various items of protective clothing.

The Medical Research Laboratory, established in 1944, at the Navy's main submarine base in New London, performs research in various phases of submarine medicine, with a view to improving the effectiveness of the submarine force. Special attention is given to the development of better methods for personnel selection, the improvement of health and living conditions aboard submarines, research designed to increase visual and auditory acuity, and the discovery of improved techniques for operating submarine equipment. The Medical Research Laboratory is well equipped with all types of technical devices for conducting auditory and visual research, including equipment to perform tests of sound discrimination, night vision, visual acuity, and color perception.

Bureau of Naval Personnel (BuPers)

The Bureau of Naval Personnel was established in 1862 as the Bureau of Navigation. Originally its duties were entirely scientific, for its responsibility was the supervision of the Hydrographic Office and the Naval Observatory. Personnel matters, at this time, were handled by the Secretary's Office. The Bureau of Navigation was given its first personnel assignment in 1864 when all matters pertaining to naval apprentices were transferred from the Secretary's Office to this bureau. The following year the detailing of officers was assigned to the Bureau of Navigation, and twenty years later, enlisted personnel functions were also transferred to it. The trend throughout the years has been to assign all personnel functions to this bureau and to remove from it all matters not related to personnel. The name, Bureau of Navigation, which had become a misnomer, was changed by act of Congress in May 1942 to Bureau of Naval Personnel.

The Bureau of Naval Personnel maintains records of officers and enlisted personnel of the Regular Navy and Naval Reserve. It determines the naval personnel requirements, fills vacancies as they occur on board ships and at shore stations, and effects transfers of duty. The procurement of officers and the recruiting and induction of enlisted men are specific functions of BuPers. Its duties also include the organization, administration, and training of the personnel of the Naval Reserve and of the NROTC.

The recruit, basic, and technical training and education of all naval personnel (except such types of training as are assigned to other bureaus, offices, or commands) are responsibilities of this bureau.

Promotion, advancement, discipline, retirement, and discharge of naval personnel are under BuPers supervision and also welfare and recreation activities and transportation of naval personnel and their dependents.

The Bureau of Naval Personnel is responsible for the preparation, revision, and enforcement of all regulations pertaining to uniforms and for instructions regarding naval ceremonies and etiquette.

Office of the Judge Advocate General (JAG)

The Office of the Judge Advocate General is responsible for all legal matters of the Navy in the field of military, administrative, legislative, and general law. This responsibility covers the entire legal field except the area of commercial law assigned to the Office of General Counsel. JAG's Office reports on the legal features of courts-martial, courts of inquiry, and boards of investigation and inquest. It also renders to the Secretary opinions on the legality of any matters referred to the office by him, including proceedings in the civil courts by or against the Government—actions, relating to insurance, contracts, patents, copyrights, and trade marks. Additional functions include the review and necessary action on international law, admiralty cases, and claims for damages involving vessels and aircraft.

Office of Naval Research (ONR)

The Office of Naval Research is responsible for coordinating research throughout the Naval Establishment. It conducts or contracts for research and development projects in augmentation of and in conjunction with those carried on by the bureaus. In addition, it is responsible for protecting the Navy's interests in patents and inventions. (See also Chapter 25, "Research and Its Effect on Naval Warfare.")

Office of Naval Material (ONM)

The Office of Naval Material is concerned with matters of policy in procurement, contracting, and production by the Navy Department and Shore Establishment in meeting the needs of the Operating Forces. In such affairs, it coordinates and directs the efforts of the bureaus and offices. This office operates a field material inspection service for the bureaus. (Legal phases of procurement matters are handled by the Office of General Counsel.)

Other Units

The preceding discussion was of the major organizational units of the Navy Department. There are, of course, many other units which are, in general, parts of the bureaus and offices already mentioned. The following offices are parts of the Executive Office of the Secretary, which has been mentioned previously as comprising boards and offices that report to and perform staff functions and services for the Secretary and his civilian executive assistants: Office of Budgets and Reports, Office of Fiscal Director, Office of General Counsel, Office of Industrial Relations, and Office of Industrial Survey.

Special mention should be made of the General Board and the Office of Public Relations, both of which are allocated to the immediate supervision of the Secretary and his civilian executive assistants.

General Board. The General Board was first created in 1900 by executive order under the presidency of the Admiral of the Navy. It was charged with formulating a general naval policy and with advising the Secretary. This was the real beginning of attempts to plan a long-range naval policy for the United States.

The General Board, acting in an advisory capacity, considers and reports upon such subjects as the Secretary of the Navy may direct. It considers the United States Naval Policy, that is, the system of principles, the general terms of their application governing the developments, organization, maintenance, training, and operation of a navy. It recommends to the Secretary of the Navy the number and types of ships for the fleet, and considers the number of naval districts, yards, stations, operating bases, and other shore activities; and advises the Secretary of the Navy respecting the general policy to be adopted toward them.

The membership of the General Board is designated by the Secretary and usually consists of from five to eight of the highest ranking officers. This group conducts hearings for the purpose of obtaining from competent witnesses information useful in establishing its recommendations. Reports and recommendations are submitted directly to the Secretary but for his information only. There are no articles of law which require the Secretary to accept or act upon any recommendation of the General Board.

Office of Public Relations. The Navy's relations with the public have progressed through two distinct periods. The first extended from the formation of the Navy in 1798 to the beginning of World War I, during which time the Secretary was, *ex officio*, the only official agent for the dissemination of news and information. The second ran from the summer of 1917 until the present, when an office or group designated by the Secretary performed this function. Official channels were established for obtaining information from within the Navy and for funneling it to the public.

The present organization is a part of the Executive Office of the Secretary. It has three subordinate divisions: Public Information, charged with the promulgation of information through established media; Civil Relations, which provides a liaison with civilian organizations; and Naval History, responsible for compiling authentic naval information of historical significance.

The official mission of the Office of Public Relations is to keep the public informed of the activities of the Navy as an instrument of national security. Its functions are to advise the Secretary of the Navy on policies relative to public relations and the dissemination of information; to initiate, coordinate, and develop channels between the Navy and the public for the accomplishment of its mission; to stimulate public interest in naval activities by liaison with civilian organizations, and to coordinate and prepare historical accounts of Navy and Marine Corps activities.

THE SHORE ESTABLISHMENT

General

The Shore Establishment, as previously mentioned, comprises the field activities of the Navy that are distributed throughout the United States and outlying territories to perform various supporting functions for the Operating Forces. During the past war, these activities reached a peak of 7,200, approximately 6,300 of which were located within the continental limits. They now total about 800.

The Shore Establishment occupies an important, central position in the Naval Establishment, for its activities are directed by the Navy Department and maintained to support the Operating Forces. In the latter function, the shore activities serve two distinct but closely allied purposes: As industrial plants, they engage in the production, maintenance, or storage of equipment required by the fleet; as bases, they constitute focal points where ships and planes can receive the servicing they require.

Geographically, the shore activities are so distributed that their services are available to the Operating Forces engaged in activities in the Atlantic, the Pacific or the Gulf waters.

Naval Districts and River Commands

Intermediate coordinating agencies between the Navy Department and the individual shore stations are the naval districts and river commands. If we think of the Naval Establishment as a business organization, the Navy Department represents the home office while the districts are the branches in the field.

The naval districts were originally created in 1903 to provide for the defense of the coast with small craft and other devices and consisted simply of strips of seacoast under a commandant who was usually also the head of a navy yard. In 1920, these districts ceased to be strips of coast, and the whole territory of the continental United States and several outlying regions was divided into administrative districts. The naval activities around Washington, D. C. (except the Navy Department) are organized into the so-called river commands. The headquarters and territory of the naval districts and river commands are as follows:

1—*Boston.* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, including Block Island.

3—*New York.* Connecticut, New York, northern part of New Jersey including counties of Monmouth and all counties north thereof (except Mercer), also the Nantucket Shoals Lightship.

4—*Philadelphia.* Pennsylvania, southern part of New Jersey, including counties of Mercer, Burlington, Ocean and all counties south thereof; Delaware, including Winter Quarter Shoal Light Vessel.

5—*Norfolk.* Maryland, less Anne Arundel, Prince Georges, Montgomery, St. Mary's, Calvert and Charles Counties; West Virginia; Virginia, less Arlington, Fairfax, Stafford, King George, Prince William, Westmoreland Counties and the city of Alexandria; also the Diamond Shoal Lightship and all waters of Chesapeake Bay, including its arms and tributaries, except waters within the Fourth Naval District and the counties comprising the Potomac River and Severn River Naval Commands west of a line extending from Smith Pt. to Pt. Lookout, thence following the general contour of the shoreline of St. Mary's, Calvert and Anne Arundel Counties, as faired by straight lines from headland to headland across rivers and estuaries.

The Potomac River Naval Command comprises the following areas, excluding the Navy Department: The Potomac River up to Great Falls, the District of Columbia and the counties of Prince Georges, Montgomery, St. Mary's, Calvert and Charles in Maryland, and Arlington, Fairfax, Stafford, King George, Prince William and Westmoreland in Virginia, and the city of Alexandria, Virginia.

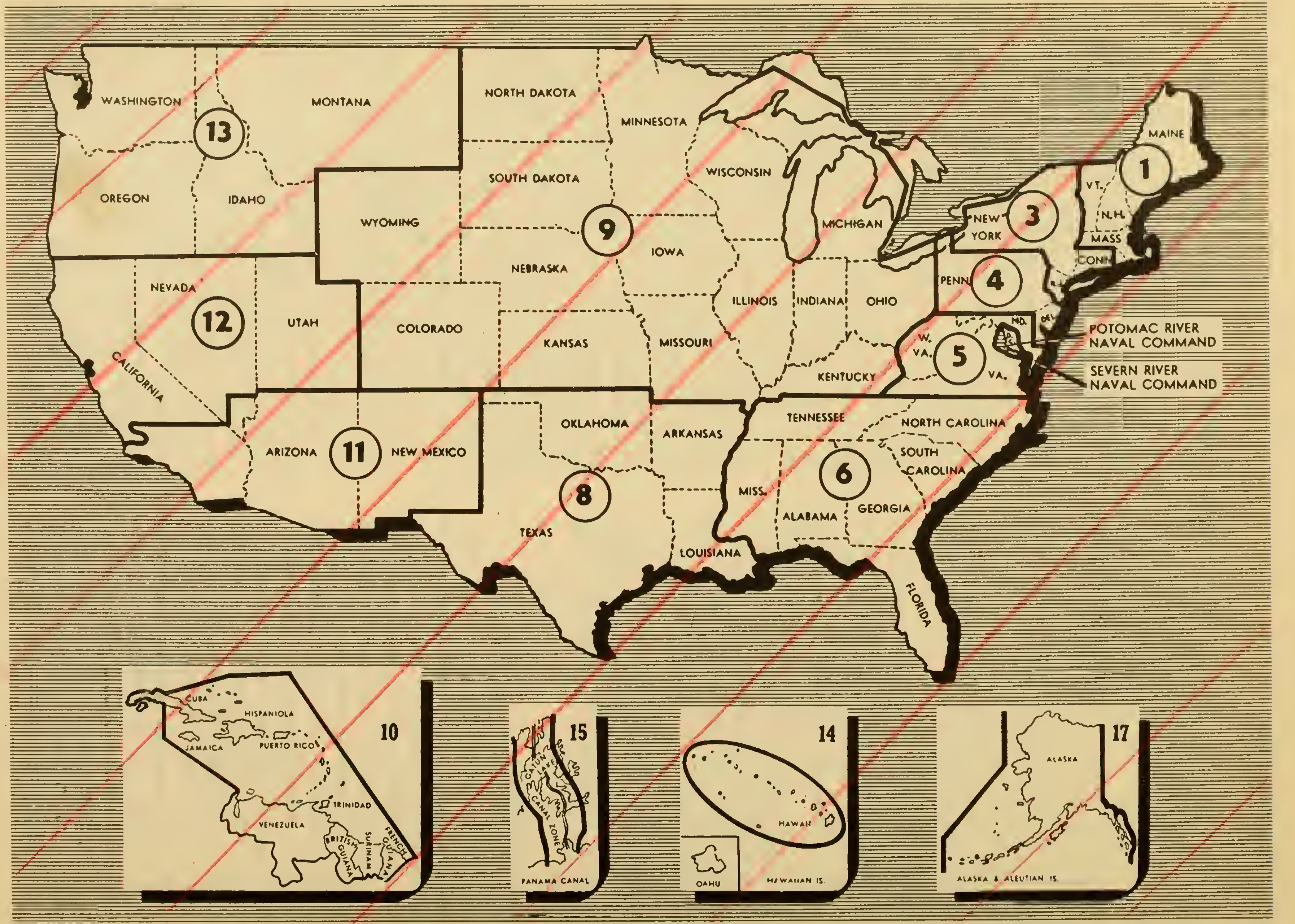
The Severn River Naval Command comprises the county of Anne Arundel, Maryland.

6—*Charleston.* North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee and Mississippi.

8—*New Orleans.* Louisiana, Arkansas, Oklahoma and Texas.

9—*Great Lakes, Ill.* Ohio, Michigan, Kentucky, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Colorado and Wyoming.

10—*San Juan.* All United States territories, possessions, naval reservations and naval activities on shore located within an area bounded as follows: Beginning at latitude 25°00′ N., longitude 72°00′ W.; thence to a point on the north coast of Cuba in latitude 22°47′ N., longitude 79°47′ W., thence westerly around shore of western Cuba and easterly along shore to Cienfuegos Light in latitude 22°02′ N., longitude 80°27′ W. (the land areas of the Isle of Pines and other small coastal islands of Cuba are included in the Tenth


WASHINGTON
MONTANA
OREGON
IDAHO
13
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
9
MINNESOTA
WISCONSIN
IOWA
MICHIGAN
NEVADA
12
UTAH
CALIFORNIA
COLORADO
KANSAS
MISSOURI
ILLINOIS
INDIANA
OHIO
ARIZONA
11
NEW MEXICO
OKLAHOMA
ARKANSAS
8
TEXAS
LOUISIANA
TENNESSEE
KENTUCKY
MISS.
ALABAMA
GEORGIA
6
NORTH CAROLINA
SOUTH CAROLINA
FLORIDA
W. VA.
VA.
5
MD.
DEL.
PENN
4
NEW YORK
3
VT.
N.H.
MASS
CONN
MAINE
1
POTOMAC RIVER NAVAL COMMAND
SEVERN RIVER NAVAL COMMAND
10
CUBA
HISPANIOLA
JAMAICA
PUERTO RICO
TRINIDAD
VENEZUELA
BRITISH GUIANA
SURINAM
FRENCH GUIANA
15
GATUN LAKE
CANAL ZONE
PANAMA CANAL
14
HAWAII
OAHU
HAWAIIAN IS.
17
ALASKA
ALASKA & ALEUTIAN IS.

NAVAL DISTRICTS AND RIVER COMMANDS

Naval District); thence south to a point in latitude 18°05′ N., longitude 80°27′ W. thence to Punta de Gallinas, Colombia; thence along international boundaries to include all of Venezuela, British Guiana, Surinam and French Guiana, to and including eastern boundary of French Guiana; thence east (true) to a point in approximate latitude 4°20′ N., longitude 50°20′ W.; thence northwesterly to a point in latitude 25°00′N., longitude 65°00′ W., and then westward to point of origin.

11—*San Diego.* New Mexico, Arizona, Clark County in Nevada; southern part of California, including counties of Santa Barbara, Kern, and San Bernardino and all counties south thereof.

12—*San Francisco.* Utah, Nevada, except Clark County; northern part of California, including counties of San Luis Obispo, Kings, Tulare, Inyo, and all counties north thereof.

13—*Seattle.* Washington, Oregon, Idaho and Montana.

14—*Oahu, T. H.* Hawaiian Islands and islands to westward, including Midway, Wake, Kure, Johnston, and Sands Island and Kingman Reef.

15—*Balboa.* Panama Canal Zone.

17—*Kodiak.* Alaska and the Aleutians.

Thus it can be seen that practically every United States Navy activity is organized under a naval district, thereby providing an effective solution to what was formerly a major administrative problem, namely, the exercising of central control over the widely scattered Shore Establishment. Under its commandant, usually a rear admiral, each district has a staff of officers representing, in general, the various functions handled by the bureaus and offices of the Navy Department.

The district is organized into units or groups according to the character of its activities and situation, with each group or unit under the command of an officer of that group or unit. The commandant is charged with coordinating the groups and units in his district to develop complete intercommunication and cooperation among them. The organization of a naval district establishes, between the commandant and the commanding officers of the groups and units included in the district, relations similar to those which exist between the commander in chief of a fleet and the various units of his command. The administrative units or groups comprise all activities which are so grouped in one place as to come logically under the immediate military control of one commanding officer. They include such activities as naval shipyards, torpedo stations, training stations, submarine bases, and schools.

Surface craft and aircraft are assigned under the command of the commandant of a naval district. The mission of the commandant of a naval district in coast defense is to control the sea communications within the district, repulsing hostile attacks on the seacoast, or upon naval vessels or merchant shipping in or off harbors or in the coastwise sea lanes.

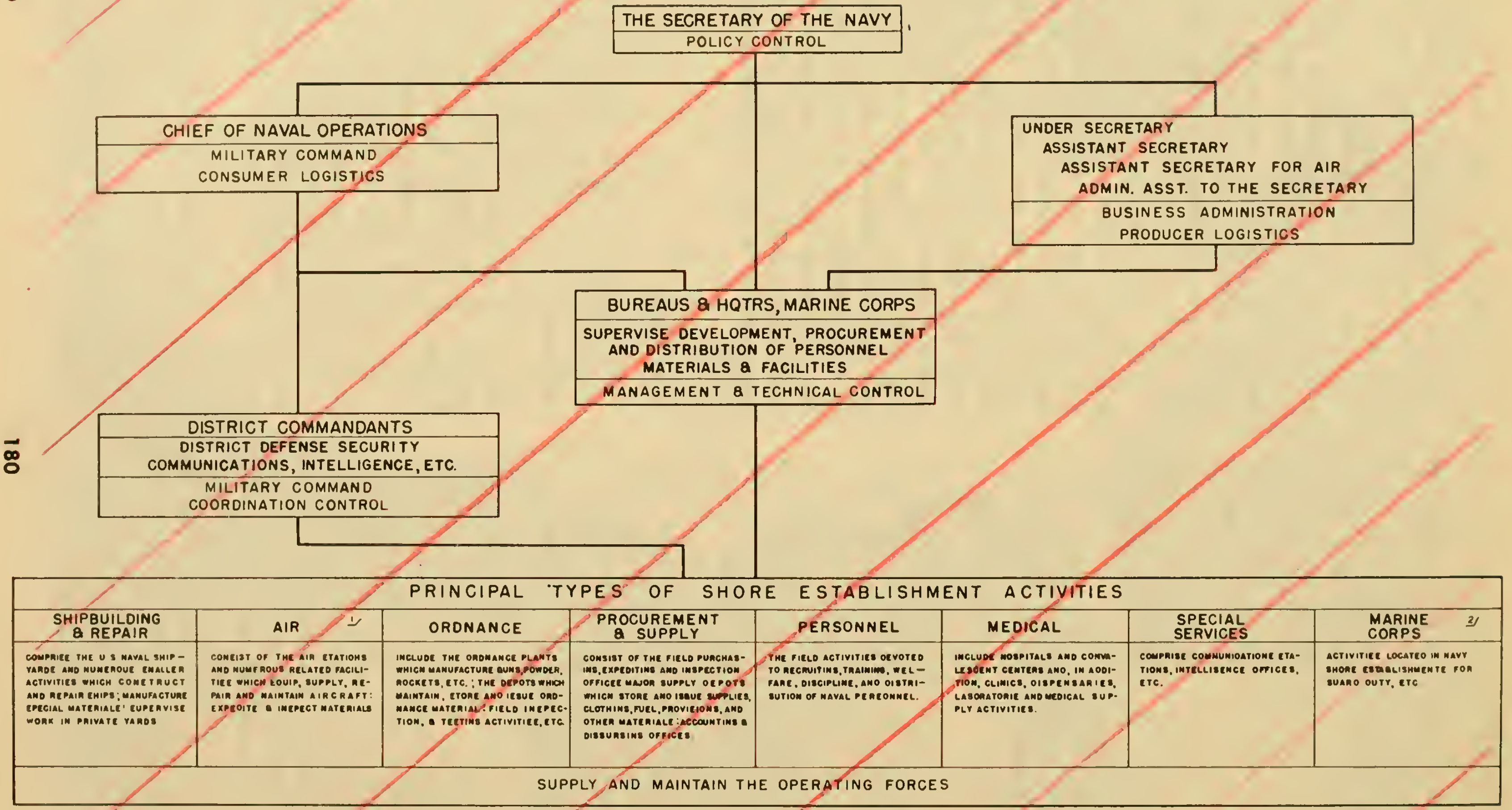
Many other functions fall within the province of the district commandant. He interprets to the public at large the acts and policies, command responsibilities, and administrative effectiveness of their Naval Establishment. He also occupies an important position in the furthering of the Naval Reserve Program within his district. He maintains an efficient district intelligence service; he has responsibility for operation of the Naval Communication Service in his district; he collaborates with local Army authorities and local representatives of other government departments; and he insures district maintenance of prescribed standards for shore patrol, uniforms, general welfare, and other matters that bear directly on discipline and morale.

Naval Bases

Following the establishment of the first navy yards in 1800, the other varied elements of the Shore Establishment came into being as a result of the additional needs of the ships that came in for repairs. Stores and ammunition were needed; personnel replacements were necessary; crew members required medical attention. With the yard as the central portion, there was created the present-day naval base.

Throughout most of the 19th century, the major portion of the Shore Establishment consisted of a few naval bases, located along the coasts. At the principal bases were the navy yard, the procurement and storekeeping facilities, the Marine barracks, and the naval hospital.

The present-day mission of a naval base is the furnishing of local logistics services direct to the Operating Forces. By definition, a naval base is a shore command in a given locality which includes and integrates all naval shore activities assigned, and these


THE SECRETARY OF THE NAVY
POLICY CONTROL
CHIEF OF NAVAL OPERATIONS
MILITARY COMMAND
CONSUMER LOGISTICS
UNDER SECRETARY
ASSISTANT SECRETARY
ASSISTANT SECRETARY FOR AIR
ADMIN. ASST. TO THE SECRETARY
BUSINESS ADMINISTRATION
PRODUCER LOGISTICS
BUREAUS & HQTRS, MARINE CORPS
SUPERVISE DEVELOPMENT, PROCUREMENT AND DISTRIBUTION OF PERSONNEL MATERIALS & FACILITIES
MANAGEMENT & TECHNICAL CONTROL
DISTRICT COMMANDANTS
DISTRICT DEFENSE SECURITY
COMMUNICATIONS, INTELLIGENCE, ETC.
MILITARY COMMAND
COORDINATION CONTROL

PRINCIPAL TYPES OF SHORE ESTABLISHMENT ACTIVITIES

SHIPBUILDING & REPAIR	AIR [1]	ORDNANCE	PROCUREMENT & SUPPLY	PERSONNEL	MEDICAL	SPECIAL SERVICES	MARINE CORPS [2]
COMPRISE THE U S NAVAL SHIPYARDS AND NUMEROUS SMALLER ACTIVITIES WHICH CONSTRUCT AND REPAIR SHIPS; MANUFACTURE SPECIAL MATERIALS; SUPERVISE WORK IN PRIVATE YARDS	CONSIST OF THE AIR STATIONS AND NUMEROUS RELATED FACILITIES WHICH EQUIP, SUPPLY, REPAIR AND MAINTAIN AIRCRAFT; EXPEDITE & INSPECT MATERIALS	INCLUDE THE ORDNANCE PLANTS WHICH MANUFACTURE GUNS, POWDER, ROCKETS, ETC.; THE DEPOTS WHICH MAINTAIN, STORE AND ISSUE ORDNANCE MATERIAL; FIELD INSPECTION, & TESTING ACTIVITIES, ETC.	CONSIST OF THE FIELD PURCHASING, EXPEDITING AND INSPECTION OFFICES; MAJOR SUPPLY DEPOTS WHICH STORE AND ISSUE SUPPLIES, CLOTHING, FUEL, PROVISIONS, AND OTHER MATERIALS; ACCOUNTING & DISBURSING OFFICES	THE FIELD ACTIVITIES DEVOTED TO RECRUITING, TRAINING, WELFARE, DISCIPLINE, AND DISTRIBUTION OF NAVAL PERSONNEL.	INCLUDE HOSPITALS AND CONVALESCENT CENTERS AND, IN ADDITION, CLINICS, DISPENSARIES, LABORATORIES AND MEDICAL SUPPLY ACTIVITIES.	COMPRISE COMMUNICATIONS STATIONS, INTELLIGENCE OFFICES, ETC.	ACTIVITIES LOCATED IN NAVY SHORE ESTABLISHMENTS FOR GUARD DUTY, ETC

SUPPLY AND MAINTAIN THE OPERATING FORCES

[1] AERONAUTICAL TRAINING ACTIVITIES UNDER CHF. NAVAL AIR TRAINING COMMAND AND CHF NAVAL AIRSHIP TRAINING AND EXPERIMENTAL COMMAND – BOTH DIRECTLY UNDER THE CNO.
[2] MARINE CORPS ESTABLISHMENTS TO TRAIN, SUPPLY AND EQUIP MARINE CORPS PERSONNEL OPERATE UNDER COMMANDANT, MARINE CORPS

Chart IV—THE SHORE ESTABLISHMENT

normally include all those capable of contributing to its mission.

Naval bases that are within naval districts are under the command of the district commandant who may be ordered to additional duty in command of a naval base located at the port where his district headquarters are situated. Each commander of a naval base has under his jurisdiction the naval shipyard and such other activities, including air stations, as may be directed by CNO. Each component activity of a naval base is under the direct control of a commanding officer or an officer in charge.

Naval Shipyards. The naval shipyards, formerly called navy yards, are components of naval bases. The first units of the Shore Establishment to come into being, they have remained the largest single units and, during the past war, employed more than a third of the Shore Establishment personnel.

Their principal function has been to repair ships. But they have also constructed new vessels and manufactured equipment for them. Construction of new vessels, especially in wartime, is done principally by private builders since this leaves the naval shipyards free for repair of war-damaged ships.

Formally stated, the mission of a naval shipyard is to provide logistic support to the Operating Forces in the form of efficient and economical building, repairs, alterations, overhauling, docking, converting, or outfitting of ships, and related special manufacturing and necessary replenishment of stores and supplies where required.

During World War II, the yards were assigned specific functions according to their location and the requirements of the war situation. The naval shipyards on the West Coast did little, if any, new construction because ships damaged in combat in the Pacific came in there for repairs. Those on the East Coast did repair work but also were able to construct a considerable number of new ships and to manufacture equipment. However, the major portion of new construction in peacetime is usually assigned to private yards.

Naval Air Bases Commands

A naval air bases command comprises, with certain exceptions, the Navy and Marine Corps aviation shore activities furnishing facilities for the operation of aircraft in each naval district. Each command is commanded by a line officer of the Navy, a naval aviator, who is under the commandant of the district. Whenever fleet air units are located at air stations in the naval air bases command, the Commander, Naval Air Bases Command coordinates his logistic support to those units with that of the appropriate Commander, Naval Base.

THE OPERATING FORCES

Definition and Mission

The Operating Forces are composed of the several fleets, seagoing forces, sea frontier forces, district forces, and such of the shore activities and other forces and activities as may be assigned.

On the Operating Forces rests the broad responsibility of fulfilling the Navy's role in support of fundamental national policies and interests throughout the world.

Down through the years, any nation has maintained its navy primarily for the attainment of the basic objective of naval warfare: To be able to travel on the seas as it pleases, and to prevent the enemy from doing likewise. In short, the purpose of the Navy is control of the seas; the Operating Forces are the means of attaining that end.

In former times, maintaining supremacy on the surface of the seas insured control; now, it has become necessary to be superior above and beneath the surface as well. A close and skillful integration of aircraft, surface craft, and undersea craft is now essential to security on the seas.

Growth and Development of the Operating Forces

By 1945, the United States had the most powerful fleet ever maintained by any nation. In numbers, our ships totaled more than all other navies combined. The fleet has passed through many stages of development since the creation of the Navy Department in 1798. The progress made has been due in large measure to the policy of retaining certain features that have worked well and discarding others in favor of new adjustments to changing conditions.

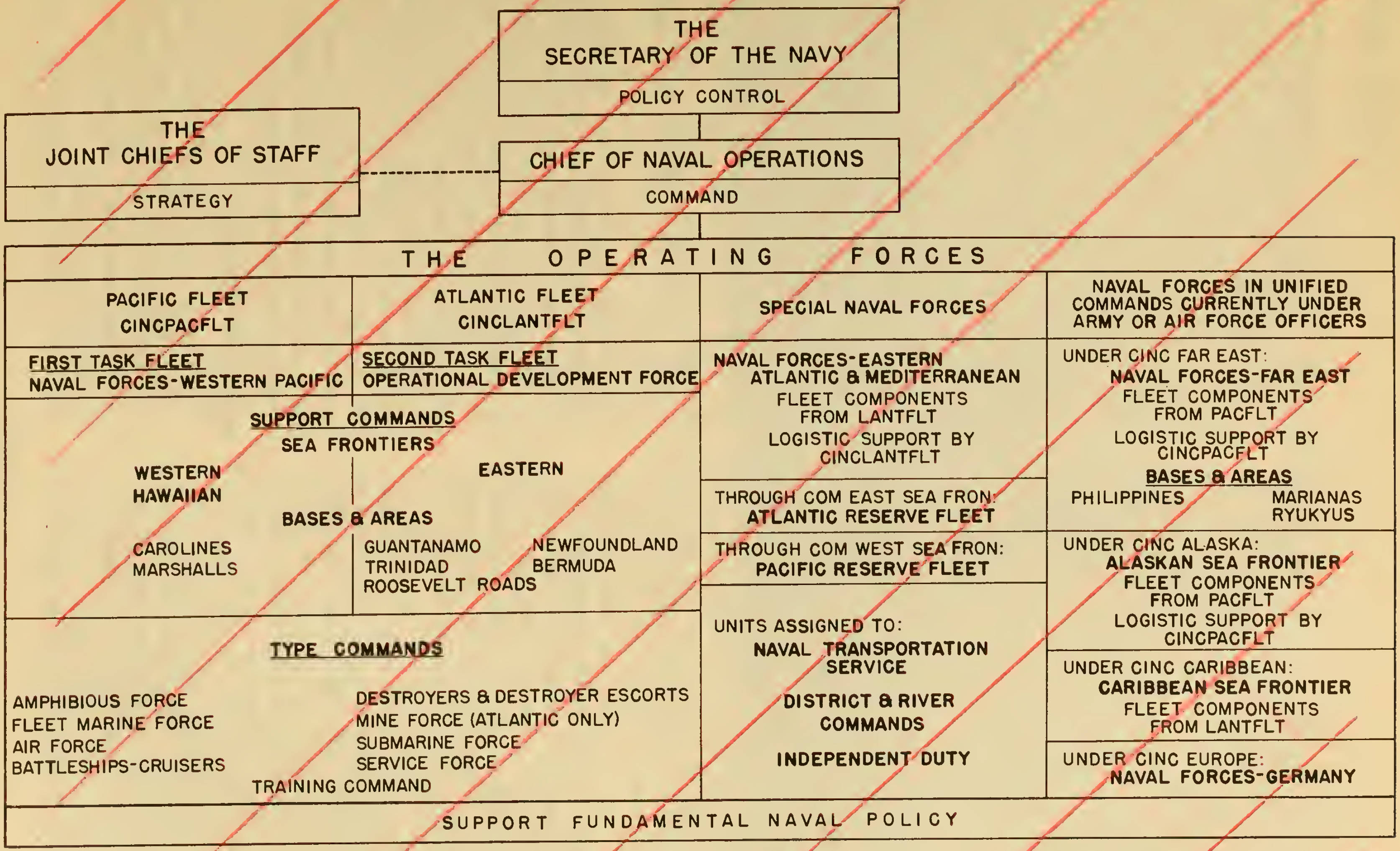
The creation of the Operating Forces occurred almost simultaneously with that of the Navy Department. When the new Constitution went into effect in 1789, the War Department was charged with both the Army and Navy, a burden then consisting of a few hundred soldiers and no ships or marines. However, the raids of the Barbary pirates led Congress to authorize the construction of six new frigates. Four years later, when the nation entered an undeclared war with France, further new construction was authorized. The first Secretary of the Navy, Benjamin Stoddert, had less than a half-dozen commissioned ships and just about as many clerks; this was the beginning of the Operating Forces and the Navy Department. (The Shore Establishment consisted mainly of ten part-time agents scattered along the coast.)

England's superior naval strength was felt in the War of 1812. Our victory was attained on the Lakes as the result of the admirable performance of three hastily built little squadrons.

From 1815 until the Civil War, this country enjoyed a long period of peace, interrupted only by the short-lived Mexican War. During this interval there was established, in 1845, the Naval Academy, which did much to improve the efficiency of the fleet. During this time also, there was placed in effect the bureau system, a major step in improving the administration

UNITED STATES NAVAL ACADEMY, ANNAPOLIS, MARYLAND

The Naval Academy was founded in 1845. The midshipmen, who are graduated as officers of the Regular Navy, spend four years here, earning their commissions in an atmosphere that is rich in traditions and history.


THE SECRETARY OF THE NAVY
POLICY CONTROL
THE JOINT CHIEFS OF STAFF
STRATEGY
CHIEF OF NAVAL OPERATIONS
COMMAND
THE OPERATING FORCES
PACIFIC FLEET
CINCPACFLT
ATLANTIC FLEET
CINCLANTFLT
SPECIAL NAVAL FORCES
NAVAL FORCES IN UNIFIED COMMANDS CURRENTLY UNDER ARMY OR AIR FORCE OFFICERS
FIRST TASK FLEET
NAVAL FORCES-WESTERN PACIFIC
SECOND TASK FLEET
OPERATIONAL DEVELOPMENT FORCE
NAVAL FORCES-EASTERN ATLANTIC & MEDITERRANEAN
FLEET COMPONENTS FROM LANTFLT
LOGISTIC SUPPORT BY CINCLANTFLT
UNDER CINC FAR EAST:
NAVAL FORCES-FAR EAST
FLEET COMPONENTS FROM PACFLT
LOGISTIC SUPPORT BY CINCPACFLT
BASES & AREAS
PHILIPPINES
MARIANAS
RYUKYUS
SUPPORT COMMANDS
SEA FRONTIERS
WESTERN
HAWAIIAN
EASTERN
BASES & AREAS
CAROLINES
MARSHALLS
GUANTANAMO
TRINIDAD
ROOSEVELT ROADS
NEWFOUNDLAND
BERMUDA
THROUGH COM EAST SEA FRON:
ATLANTIC RESERVE FLEET
THROUGH COM WEST SEA FRON:
PACIFIC RESERVE FLEET
UNDER CINC ALASKA:
ALASKAN SEA FRONTIER
FLEET COMPONENTS FROM PACFLT
LOGISTIC SUPPORT BY CINCPACFLT
TYPE COMMANDS
AMPHIBIOUS FORCE
FLEET MARINE FORCE
AIR FORCE
BATTLESHIPS-CRUISERS
DESTROYERS & DESTROYER ESCORTS
MINE FORCE (ATLANTIC ONLY)
SUBMARINE FORCE
SERVICE FORCE
TRAINING COMMAND
UNITS ASSIGNED TO:
NAVAL TRANSPORTATION SERVICE
DISTRICT & RIVER COMMANDS
INDEPENDENT DUTY
UNDER CINC CARIBBEAN:
CARIBBEAN SEA FRONTIER
FLEET COMPONENTS FROM LANTFLT
UNDER CINC EUROPE:
NAVAL FORCES-GERMANY
SUPPORT FUNDAMENTAL NAVAL POLICY

• Chart V—THE OPERATING FORCES

of the Navy's affairs, both ashore and afloat. Within this period, the transition from wood and sail to steel and steam was inaugurated; further, rifled guns were just beginning to be considered as superior to the old smoothbores. In the midst of these great changes, the nation plunged into the Civil War.

It was indeed a strange assortment of ships that assembled to carry on the naval phase of that war. The Northern fleet ranged from a 60-year-old frigate and several East River ferryboats to experimental ironclads of various types. They faced the novel opposition of rival armored vessels, in addition to steam commerce raiders, mines, and even a primitive submarine. For a short period following the war, the American Navy led the way in the experiments of the naval revolution. Then for nearly 20 years, it was handicapped by lack of funds, and progress ceased. Afloat and ashore, organization remained static.

But ideas regarding ship construction were undergoing revolutionary changes, and by 1890 modern navies had begun to emerge; clear-cut types of ships appeared—battleships and cruisers, constructed of steel and propelled by steam. The United States still inclined to emphasis on cruisers. However, the writings of Mahan had an almost immediate influence on the United States Navy. He was an advocate of the idea that "war, once declared, must be waged offensively, aggressively." Cruisers, he believed, were inadequate for such a purpose. Ships of the line, operating aggressively, and as a fleet, were the only means of securing victory on the sea. About six weeks after the appearance of Mahan's book, *The Influence of Sea Power on History, 1660-1783*, Congress authorized the construction of three battleships.

Within five years after the Spanish-American War, we had a potent battleship fleet, and in 1908 our Great White Fleet sailed around the world. Fleets were growing in complexity: Powerful torpedoes that could seriously damage a battleship were delivered by speedy little torpedo boats; as a protection, larger torpedo boat destroyers were developed to accompany the capital ships; these destroyers were useful against another new development—the submarine—designed for more stealthy delivery of torpedoes, and used effectively in World War I as commerce raiders.

During this war, naval aviation had its beginning. In fleet maneuvers in 1913, the worth of aircraft as an instrument of warfare had been proved, for they performed such duties as scouting and locating minefields and submarines. Following the war, naval aviation was effectively integrated into every part of the Naval Establishment, bringing about in 1921 the establishment of the Bureau of Aeronautics.

The introduction of naval aircraft led in 1922 to the collier *Jupiter* (renamed *Langley*) being converted into an aircraft carrier. Thus another ship type was added to our fleet.

The period between the two World Wars was characterized on our part by a sincere attempt to preserve the peace through keeping our fleet strength at a minimum. It was fortunate, indeed, that during this time our Navy did, however, carry on schedules of operation, competitive training, and instruction unparalleled in any other navy of the world. Fleet problems, tactical exercises, amphibious operations with the Marines and Army, aviation, gunnery, engineering, and communications were all integrated in a closely packed annual operations schedule. Some ships were added to the fleet but no substantial increases were approved until 1938, when in consideration of conditions abroad, the President in his message to Congress recommended a 20-percent increase in our naval strength.

The so-called Two-Ocean Navy Bill of July 1940 authorized over a million tons of combatant ships—the largest naval expansion ever authorized. By that time, Germany had disposed of France; had overrun the Netherlands, Belgium, Norway, Denmark, and Poland; and stood on the Channel coast, poised for an all-out attack on Britain. Immediately following passage of this bill, production was speeded up in all essential areas. Our shipbuilding facilities had been expanded upon the outbreak of war in Europe in September 1939, and they were ready to handle the heavy schedule of production that followed passage of the bill and continued until final victory.

Responsibility of CNO

Over-all command of the Operating Forces devolves on the Chief of Naval Operations, subject to the supreme authority vested in the President by the Constitution and in the Secretary of Defense and the Secretary of the Navy by law.

Those parts of the world outside the continental

CULMINATION OF ALL EFFORT

A ship ready for action represents the efforts of all elements of the Naval Establishment: the Navy Department, the Shore Establishment, and the Operating Forces.

United States in which our armed forces are operating are divided into unified commands. This is in accordance with a Joint Chiefs of Staff plan approved by the President in 1946. Each of these commands is under a commander in chief who has unified command over all forces—Army, Navy, and Air Force—assigned to him by the Joint Chiefs of Staff. The Chief of Naval Operations is now the Joint Chiefs of Staff executive agent for the Pacific and Atlantic Commands.

The movements and operations of the Operating Forces are directed by the Chief of Naval Operations through the appropriate commanders in chief and other commanders. He is responsible to the Secretary of the Navy for the use of the Operating Forces including, but not limited to, their training, readiness, and preparation for war. CNO coordinates and directs the efforts of the bureaus and offices as may be necessary to insure availability and distribution of the personnel and material required for the Operating Forces when and where they are needed.

The Forces Afloat

No detailed description of the disposition of the forces afloat is given here. Obviously, the greatest military efficiency is attained when the fighting organization is a flexible one, capable of being shifted quickly as the necessity arises. Such an organization is the fleet—the Operating Forces. Ample proof of that fact was seen in World War II when the Navy was always able to concentrate the proper assemblage of ships, men, and material—both in amount and type—for the varying exigencies of global war.

Some major breakdowns may be mentioned here to show how the Operating Forces are organized in peacetime to help support the nation's fundamental naval policy.

Major commands operating directly under the Chief of Naval Operations include the Pacific Fleet, the Atlantic Fleet, and the Naval Forces Eastern Atlantic and Mediterranean. (See Chart V.) The composition of both the Atlantic Fleet and Pacific Fleet includes vessels and ships classified by type. These are referred to as type commands, and a few titles will help to explain this term: Submarines, Atlantic; Submarines, Pacific; Amphibious Forces, Atlantic; Amphibious Forces, Pacific; Air Force, Atlantic; and so on.

The Commander in Chief, Pacific Fleet has under his command the First Task Fleet; the Commander in Chief, Atlantic Fleet has the Second Task Fleet. The vessels that comprise the task fleets are appropriate types assigned temporarily from the type commands. Thus, an aircraft carrier might be under the operational control of Commander, First Task Fleet, but under the administrative command of Commander, Air Force Pacific.

Support commands include certain sea frontiers and bases and areas. The sea frontiers have formerly functioned primarily for frontier defense, control of shipping, protection of shipping and conduct of antisubmarine warfare within the frontier waters. Their mission has been broadened by CNO who has assigned all naval districts to appropriate sea frontier commanders for military command and coordination control of logistic support as between component districts.

In connection with the Second Task Fleet, it should be explained that the function of the Operational Development Force is to test and evaluate new weapons and equipment for Service use.

CHAPTER 10

CONSTRUCTION OF SHIPS

PRELIMINARY STEPS

Factors in Naval Construction

In the construction of any ship, certain factors must be considered: armament, protection, seaworthiness, stability, maneuverability, speed, and cruising range.

Armament comprises the weapons which are employed to inflict damage upon the enemy, and is thus the gage by which the offensive power of the ship is measured. Armament includes main battery guns, secondary battery guns, antiaircraft guns (secondary battery and heavy AA guns may be combined by employing double-purpose guns), torpedoes, depth charges, and such planes as may be used for torpedo attacks, bombing, or strafing. *Protection* comprises those features which are provided to defeat or minimize the effects of the enemy's weapons. Included in this category are such protective installations as horizontal and vertical armor, internal subdivision by longitudinal (found in large ships only) and transverse bulkheads for limiting the spread of flooding resulting from damage. Torpedo defense systems are also found in ships of large displacement.

Seaworthiness is the term used to describe the capability of a ship to operate at sea in all the kinds of wind, weather, and seas likely to be encountered. It is effected by such factors as stability, size, and freeboard. *Stability* is the term used to describe the ability of the vessel to return to an upright position when heeled over by an external force and is a partial measure of the ship's ability to absorb punishment involving underwater damage and flooding. In addition, stability has an important influence on the period of roll which, to some extent, determines the suitability of any given vessel as a gun platform. *Maneuverability* is the characteristic which permits rapid changes of course and speed and includes the ability to turn in a small diameter.

Speed is the characteristic which is determined by the shape of the ship underwater and the power and efficiency of the propelling plant. *Cruising range* is the ability to remain at sea for long periods of time and traverse large distances. It is determined by fuel capacity, fresh water capacity, evaporator capacity, efficiency of the propelling plant with respect to fuel consumption, and last but not least, provision capacity, including refrigerated stores.

It is obvious that these qualities are not independent of each other. For example, a change in speed requirements will affect considerably the cruising range. Heavier armor, on the other hand, will reduce the proportion of weight which can be used for machinery, and hence will tend to reduce the potential speed of the ship. The designer of every ship tries to incorporate as many of these features as possible, in keeping with the general use to which the particular ship or type of ship will be put. Battleships, aircraft carriers, cruisers, and destroyers all represent a compromise in which most of these features are present in varying degrees. Submarines are far more specialized and sacrifice one or more of these qualities for some special function or quality. The modern high-speed battleships and aircraft carriers represent the nearest approach to the ideal combination of all characteristics necessary to the most effective warship.

Design

The responsibility for the design and construction of the ships and boats of the United States Navy lies with the Bureau of Ships. The need for any specific type of ship is usually decided upon by the General Board, a committee composed of high-ranking naval officers. When it is considered that a certain type of vessel is necessary, the General Board, assisted by the technical bureaus of the Navy Department, draws up a generalized list of requirements in regard to armor, armament, speed, radius of action, and other important features.

With the general requirements as a guide, the naval architects in the Preliminary Design Section of the Bureau of Ships determine the displacement, principal dimensions, form, and interior arrangement of the vessel. The strength, stability, and resistance to damage are also investigated at this time. The design of any naval vessel is an infinitely complex work involving the balancing of many factors. This work is done in the form of a series of design studies, each of which is a complete preliminary design, differing from the others in the type of compromise effected among the various requirements. Sometimes as many as twenty of these studies are made before one is finally selected as the design from which the vessel will be built. This study then goes to the Hull and Machinery Design Sections where larger-scale and more detailed contract plans are drawn. It is at this stage that the detail features of the design are developed and many details worked out which were not included in the preliminary study. Following this, large-scale, detailed working plans are drawn, often in the shipyard where the vessel is to be built.

The Plans

The first step in the construction of a ship is, of course, the drawing of the working plans, generally constructed to a scale of one-quarter inch or one-half inch tc the foot. From these a full-scale set of plans is made in the mold loft. The full-scale plans are actually laid off on the mold-loft floor and from them thin wooden or hard paper *templates* (patterns) are cut for each plate and structural member necessary. The templates are taken to the prefabricating shop where the steel plates and structural shapes are cut and numbered for identification purposes.

BASIC STRUCTURE OF A SHIP

The Plating

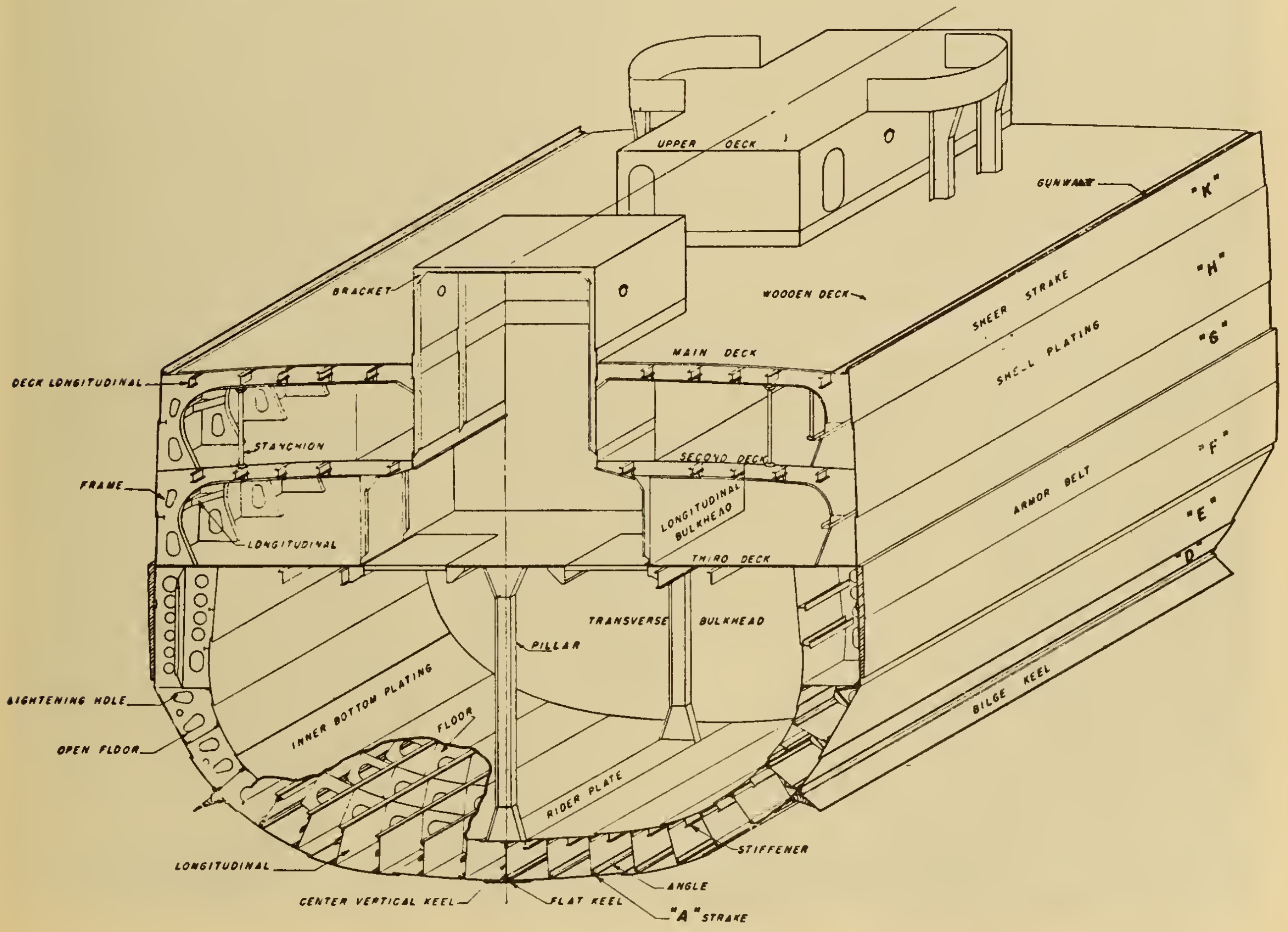
A ship is structurally a box girder. The *shell plating* forms the sides and bottom of this box girder and the weather deck forms the top. The point where the weather deck and the *side plating* meet is called the *deck-edge* or *gunwale,* while the location where the *bottom plating* and the side plating meet is called the *bilge.* Usually the bottom is rounded into the side of the vessel to some degree and this rounding is called the bilge of the vessel. Most merchant vessels and battleships have a box-like section, with vertical sides and a flat bottom like a rowboat. High-speed vessels such as destroyers and cruisers, however, have rising bottoms and broad rounded bilges. The individual shell plates are generally rectangular in shape, the short sides being called the *ends* and the long sides being called the *edges.* End joints are known as *butts* and edge joints are called *seams.* The plates are joined together at the butts to form long strips of plating running lengthwise. These fore-and-aft rows of plating are called *strakes.* The strakes are lettered from the *keel* outward, around the turn of the bilge and up to the gunwale. The strake next to the keel on each side is called the *A-strake.* In the days of wooden ships this strake was known as the *garboard strake* but this term no longer has much meaning. The uppermost side strake, at the gunwale, is called the *sheer strake.* This strake is an important structural member of the ship and is much thicker than most of the other strakes. The shell plating, together with the weather deck, forms the watertight envelope of the vessel and its main purpose is to exclude water from the interior. It also is a major contributor to the strength of the hull structure. It is aided in these duties by the internal structural members of the hull.

The Keel

The most important structural member of a ship is the *keel.* The keel is an internal structure running the length of the vessel from the *stem* to the *stern frame* along the bottom. It acts as a backbone, performing a function similar to that part of the human structure. The keel does not project below the bottom of a vessel as does the fin keel of a sailboat, but lies entirely within the ship. It is built up of plates and angles into an I-beam shape. The lower flange of this I-beam structure is the *flat plate keel* which forms the *center strake* of the bottom plating. The web of the I-beam is known as the *center vertical keel.* The height of this center vertical keel varies from about two feet in small vessels to nearly seven feet in large vessels. The upper flange of the I-beam is called the *rider plate.* If the vessel is fitted with an *inner bottom,* the rider plate forms the center strake of the inner bottom plating. At the ends of the vessel the keel is joined to two heavy castings known as the stem and stern frame which complete the backbone,

Framing

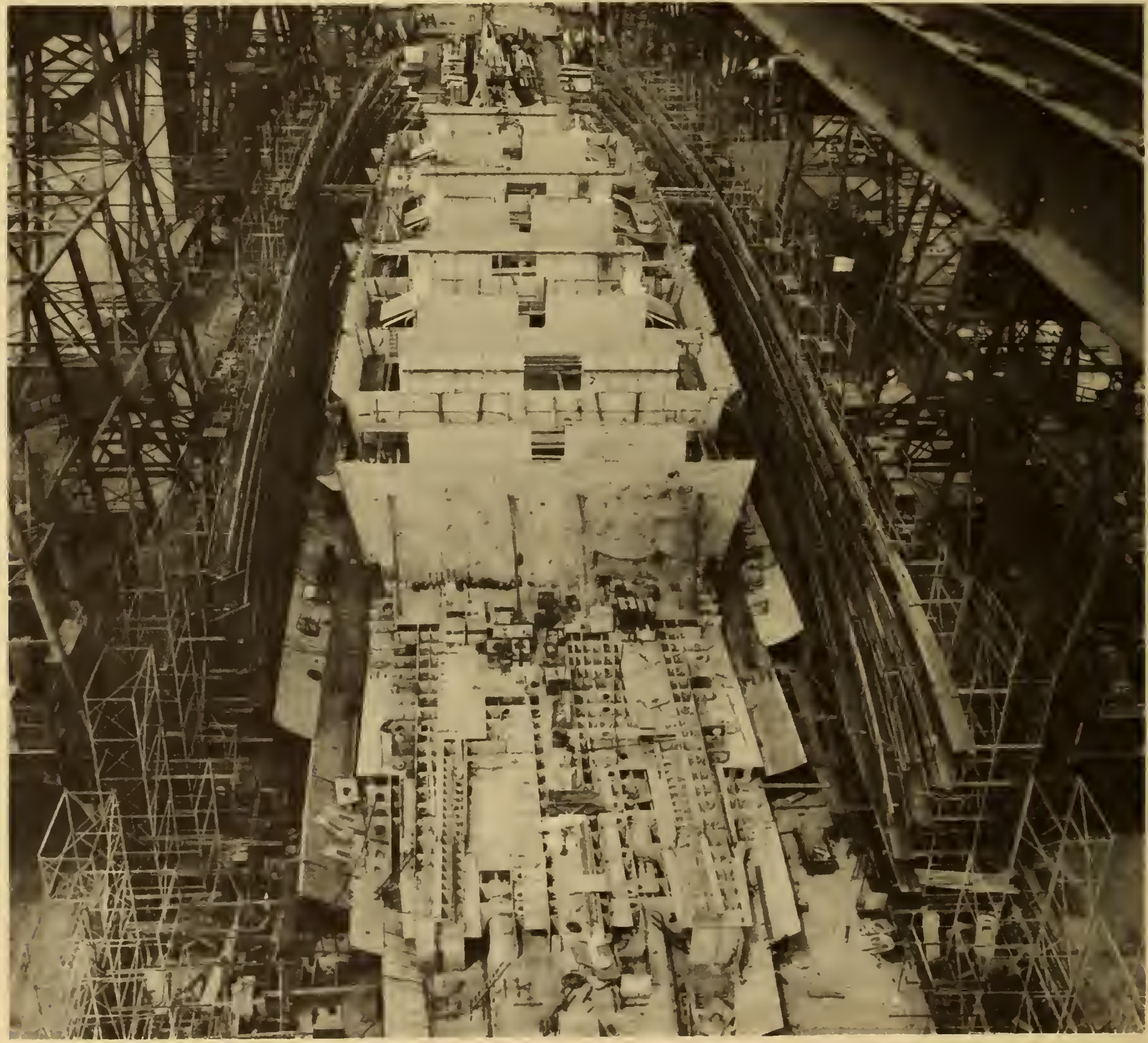
The shell plating is assisted in resisting the pressure of water, wind, and wave by two sets of stiffening members called *frames.* One set of frames, known as *transverse frames,* extends from the keel outward around the turn of the bilge and up the sides like the ribs of a human being. They are closely spaced along the length of the ship and define the form of the vessel. The other set of frames is called *longitudinal frames* or, more often, simply *longitudinals.* These structural shapes run parallel to the keel along the


UPPER DECK
GUNWALE
"K"
WOODEN DECK
"H"
SHEER STRAKE
SHELL PLATING
"G"
BRACKET
MAIN DECK
DECK LONGITUDINAL
STANCHION
SECOND DECK
FRAME
LONGITUDINAL BULKHEAD
LONGITUDINAL
THIRD DECK
"F"
ARMOR BELT
"E"
"D"
TRANSVERSE BULKHEAD
PILLAR
LIGHTENING HOLE
INNER BOTTOM PLATING
FLOOR
OPEN FLOOR
BILGE KEEL
RIDER PLATE
STIFFENER
LONGITUDINAL
ANGLE
CENTER VERTICAL KEEL
FLAT KEEL
"A" STRAKE

STRUCTURE OF A CRUISER
Detailed drawings of inner structure of naval ships generally are highly classified.

bottom, bilge, and side plating, and tie the transverse frames and bulkheads together along the length of the ship.

Where the two sets of frames intersect, one set must be cut to make way for the other. Those which are not cut are known as *continuous* frames, while those which are cut (and thus weakened) are known as *intercostal* frames. This gives rise to two important ways of building a ship. One method is to make the transverse rib-like frames continuous and make the longitudinals intercostal between them. In this method the transverse frames are spaced very closely, about every two feet along the length of the ship, while the intercostal longitudinals are relatively few. Most merchant cargo vessels and wooden vessels are built in this fashion and they are known as *transversely framed* vessels. The alternate method is to allow the longitudinals to remain continuous along the length of the



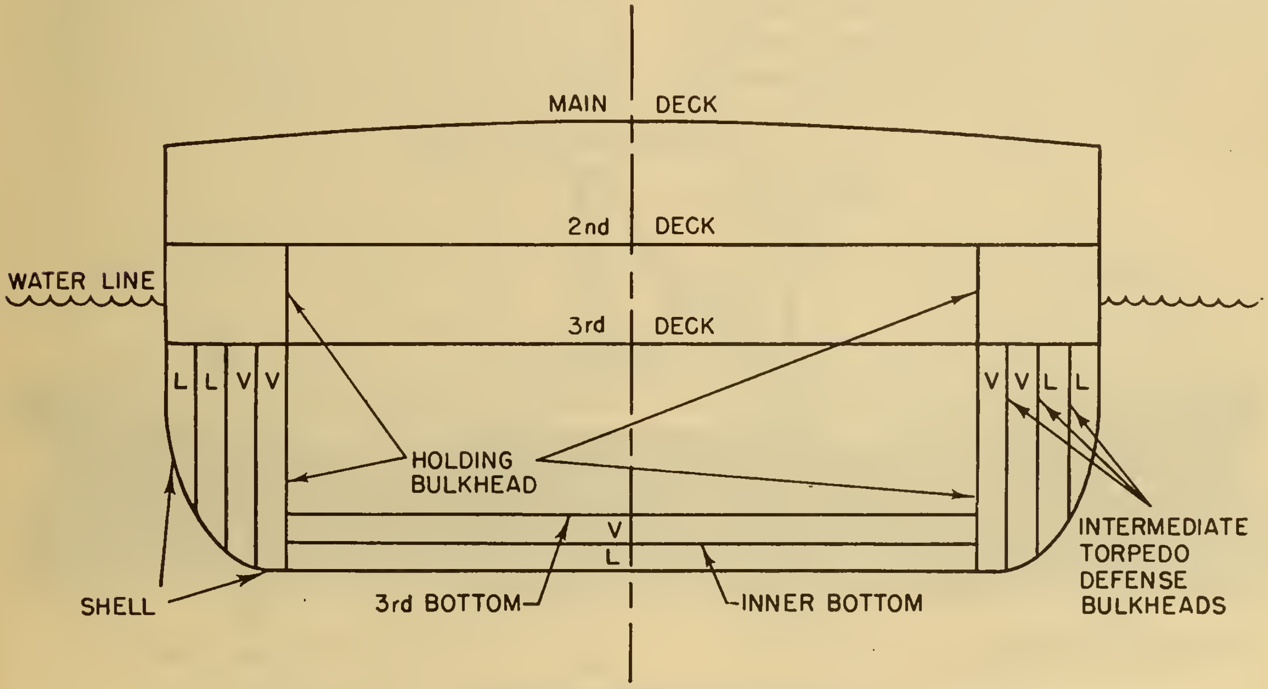
A BATTLESHIP IS BORN
View of USS *Illinois* (BB65) from stern looking forward, at the Philadelphia Naval Shipyard.

ship and make the transverse ribs intercostal between them. The longitudinals are quite numerous but the transverse frames are spaced farther apart. Most naval vessels and oilers are built in this fashion and are known as *longitudinally framed* vessels. While it is a more difficult form of construction, vessels so built are stronger than those which are transversely framed. Transverse frames are usually numbered consecutively from bow and stern. Longitudinal frames are numbered from keel to gunwale.

Inner Bottom and Torpedo Protection

The two sets of stiffening frames, *transverses* and *longitudinals*, criss-cross each other like a grating. When the frames are designed as deep plate members, like the keel, they form a boxlike framework similar to a honeycomb. This method of designing the bottoms is called *cellular* construction. The transverse frames are called *floors* when they are designed as deep girders. The longitudinal frames are still called longitudinals. On vessels larger than destroyers, this cellular double bottom is usually covered by a layer of watertight plating called the *inner bottom* or *tank top*. This inner bottom provides a barrier against flooding in the event that the outer bottom is ruptured by grounding, etc. It also contributes greatly to the strength of the vessel and encloses the cellular double bottoms into a series of tanks in which are carried fuel oil, fresh water, and ballast. Each tank is composed of several of the cells of the double bottom. The floors which form the partitions of the tanks are watertight or oiltight and are called *solid floors*. The floors within the tank have large holes (called *lightening holes*) cut in them both to save weight and to allow access to various parts of the tank. Such floors are called *open floors*. This system of *outer bottom* (or shell plating), inner bottom plating, and cellular double bottom results in a tremendously strong structure.

The double bottoms in a merchant-type vessel extend across the bottom of the vessel from bilge to bilge. The inner bottom or tank top is flat and acts as the bottom of the cargo holds. Destroyers and smaller vessels do not usually have two bottoms. Cruisers have an extensive double bottom system which extends from the keel around the bilge and up the side



TORPEDO PROTECTION SYSTEM
This drawing illustrates the principle involved in the torpedo protection system used in some large naval vessels.

to above the waterline. Battleships and large aircraft carriers have the most extensive systems afloat. Many battleships have triple bottoms to protect the vessel from mine explosions under the vessel. The double bottom systems along the sides have grown into complicated torpedo protection systems having from four to seven layers of cells.

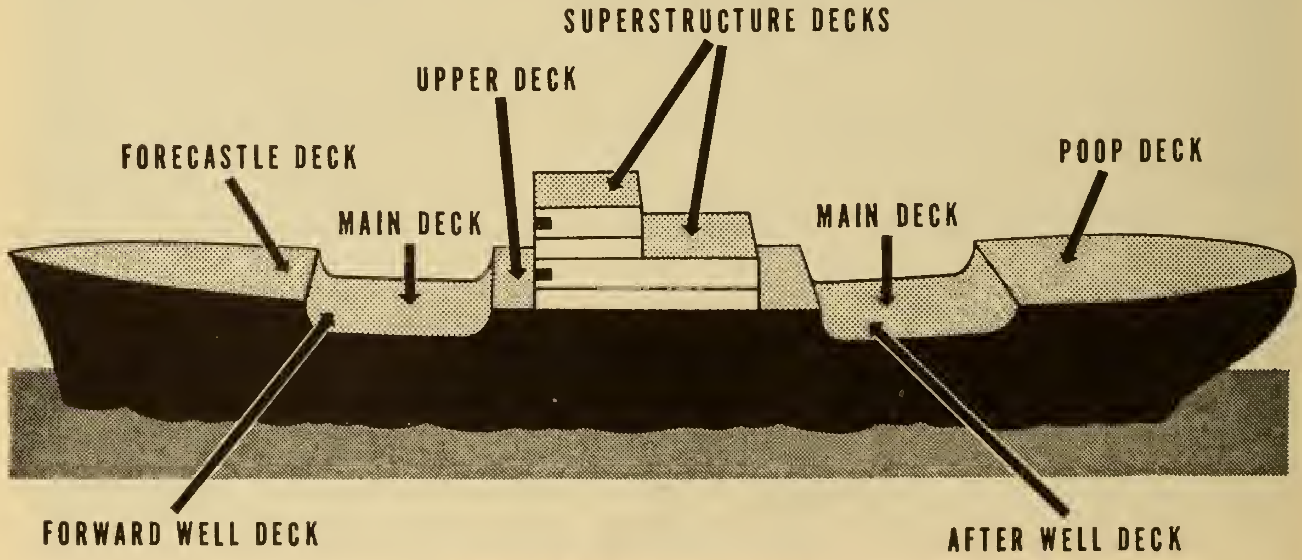
The illustration on page 191 shows one type of torpedo protection system which has been developed as a result of extensive research, experimentation, tests, and practical experience with heavy ships hit by torpedoes. (Note: L = liquid; V = void.) The inboard bulkhead is called the *holding bulkhead*; it is expected to withstand damage and deflection without leakage, even though bulkheads outboard of it are ruptured. The holding bulkhead extends from the shell at the bottom of the ship to the third deck. A lighter bulkhead continues upward to the second deck, one deck height higher than the other protective bulkheads.

When an explosion takes place, the shell is ruptured with great force. As the distance into the ship increases, the destruction of structure diminishes. The intent of the design is to construct the system so that each of the torpedo defense bulkheads will stretch as far as possible, and absorb a maximum of the energy of the explosion before letting go. This so weakens the effect of the explosion that by the time the remaining force reacts upon the holding bulkhead, the latter is strong enough to withstand the resulting distortion without failure. Thus, flooding of the vital inboard spaces is prevented (although wing voids may flood over a considerable length).

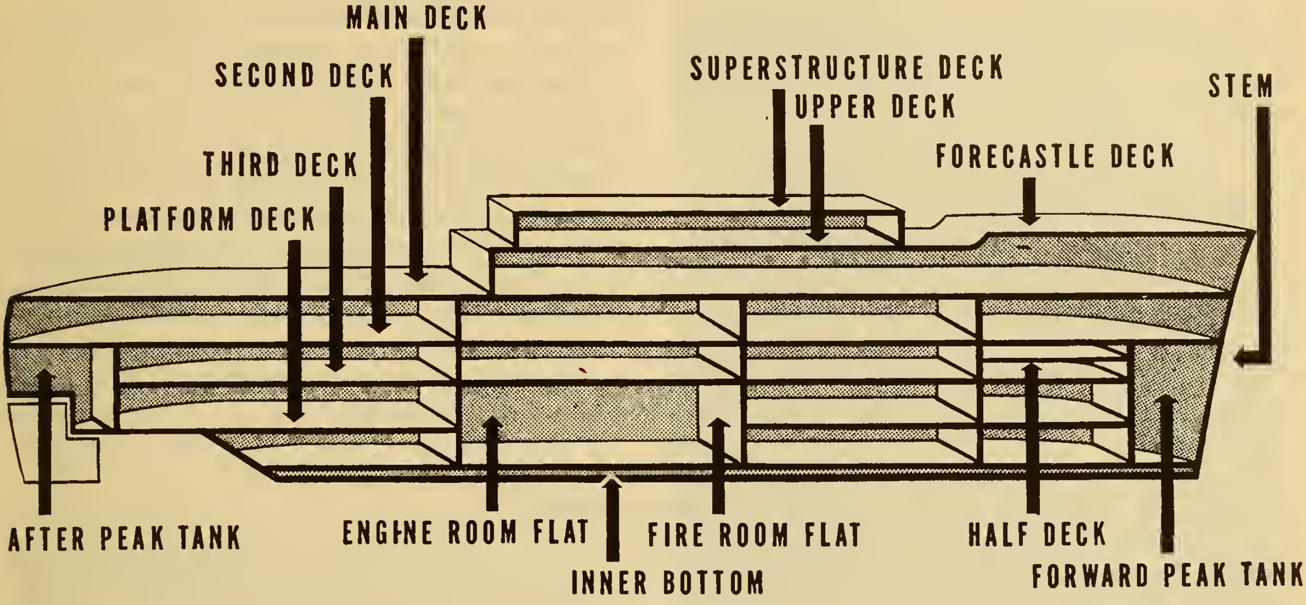
At the same time, it is necessary to suppress the fragment and flash. Experience has proved that one deep layer of liquid, either oil or water (several feet in transverse depth), or two shallower layers of liquid somewhere in the system, are required to prevent large fragments of shell plating and other material from causing fragment damage to interior bulkheads and extension of flooding.

Bulkheads

The interior of the vessel is divided into compartments by vertical walls called bulkheads. Bulkheads are either watertight *structural bulkheads* or merely partitions or *joiner bulkheads.* Structural bulkheads give the ship contour, shape, rigidity, and strength. They serve to divide the ship into numerous *watertight compartments* or rooms. They may be transverse bulkheads, extending athwartships, or longitudinal bulkheads, extending fore and aft. They not only subdivide the ship but serve to tie the shell plating, framing, and decks together in a rigid structure. Transverse bulk-



WEATHER DECKS



DECKS

heads are numbered to correspond with the transverse frames which they replace.

Decks

The ship is divided horizontally by a series of *decks* and *platforms* into tiers of compartments, the decks forming the floors and ceilings of the compartments just as the bulkheads form the walls. However, the floor of a compartment is always called the deck and the ceiling is always called the *overhead*. This is because the words floor and ceiling have other meanings on board ship. As we have already learned, a floor is a transverse partition in the double bottoms. The *ceiling* is a wood sheathing in the cargo hold and is used to protect the cargo from damage which might result if it were to strike against the steel structure of the vessel.

The deck is composed of rectangular steel plates joined into strakes similar to the shell plating. The plates in the outermost strake of deck plating, which are called the *stringer plates* and are connected to the shell plating, are important structural members in the ship. The deck plating is strengthened by transverse and longitudinal *deck beams* and *deck girders* on the underside of the deck. These beams and girders are usually composed of I-beams or channel beams. They are fastened to the shell frames by means of triangular steel *brackets*. The weather deck is usually covered by a wooden deck which provides insulation to below-deck spaces and offers safer footing to the crew in wet weather. The decks above the waterline are usually arched so that they are higher at the centerline than at the deck-edge, to aid in drainage of occasional water. This arch is called *camber*.

A deck is named in two ways: first, by its position in the ship and, second, by its use or function. Decks extending from side to side and from stem to stern are *complete decks*, while decks occurring only in certain portions of the vessel are called *partial decks*. The uppermost complete deck is called the *main deck*. The complete decks below this are called the second deck, third deck, etc., normally being numbered downward. Partial decks which occur in only one portion of the ship have special names, such as:

a. *Forecastle deck:* a partial deck above the main deck at the bow.

b. *Half deck:* a partial deck below the main deck at the bow only.

c. *Upper deck:* a partial deck above the main deck amidships. It is part of the superstructure unless the side plating is carried up to its level. (Additional decks above this in the superstructure are usually named for their use, as: *communication deck*, *signal bridge*, or *navigating bridge.*)

d. *Poop deck:* a partial deck above the main deck in the stern, usually only in merchant ships.

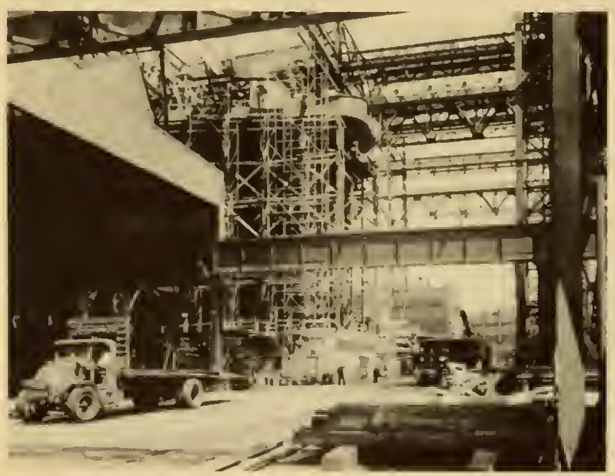
Partial decks which occur in the bow and stern portions of the vessel below the lowest complete deck, but which are broken to provide for the machinery spaces, are called *platforms*. These are numbered downward, as first platform, second platform, etc. The inner bottom is usually called the *hold*. Miscellaneous working platforms or flats consisting of gratings are located in the machinery spaces to aid in the operation of the ship's engines.

In addition to the above nomenclature, some decks are known by names describing their use or function. Thus, the uppermost deck extending from side to side in any portion of the vessel is known as the *weather deck*. The deck which carries heavy plating to resist enemy projectiles or bombs is called the *protective deck* or *armor deck*. A subsidiary protective deck is sometimes installed. It has light armor plating and is located just below the armor deck to protect the below-deck vital spaces against fragments. This deck is known as the *splinter deck*.

SHIPBUILDING PROCEDURE

The Ways

The procedure followed in building a ship varies widely, depending on the type of ship, by whom it is built, and whether it is predominately of riveted or of welded construction. In general, however, the primary operations are similar. The ship normally is built on a sloping concrete platform called a *way*. The slope of the way is called its *declivity*. The way is sloped so that when the ship is launched it will slide into the water under its own weight. A row of building blocks is placed down the center of the way upon which the keel is erected. These blocks are high enough so that workmen can work under the hull while the ship is being built. A wooden *cradle*, shaped in the form of the shell of the ship from the keel to around the turn of the bilge, is then erected on either side of the building blocks. *Bilge cribs* are placed along the bilge at intervals to support the weight of the sides as the vessel is built. As the hull is erected, scaffolding is raised along the sides to facilitate construction.



BUILDING WAYS AT A NAVAL SHIPYARD
Naval shipyards, formerly called navy yards, were the first units of the Shore Establishment to come into being. During a war, much naval ship construction is done at private building yards, leaving the naval shipyards free to perform repairs on war-damaged ships.

Subassembly Bays

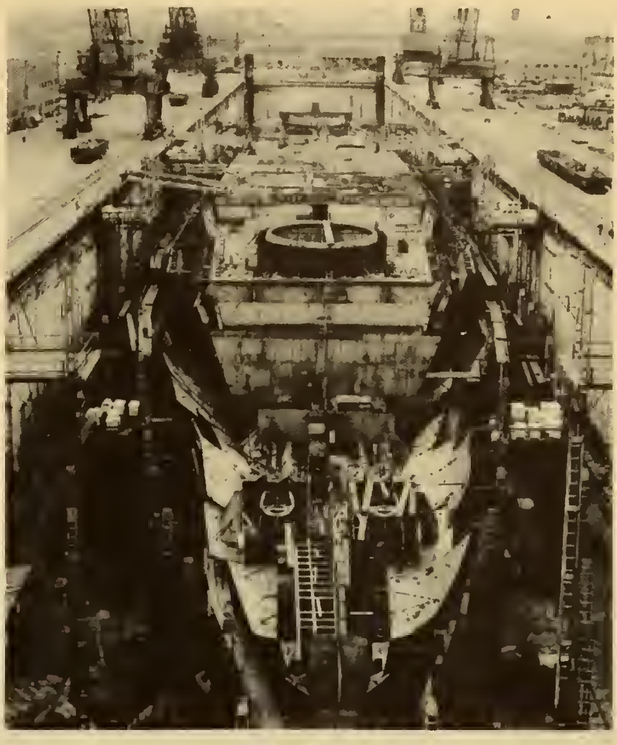
The modern practice is to assemble rather large portions of the ship in subassembly bays located some distance from the ways. At one point all the bulkheads are constructed, complete with stiffeners and other fittings. At other bays, whole sections of the side plating with frames attached are welded. Complete sections of double bottoms, consisting of shell plating, transverse floors, longitudinals, and inner bottom, equipped with piping and valves for the tanks and other fittings, are assembled at other points. Large gantry or "whirly" cranes carry these subassemblies, some of which weigh as much as 50 tons, to the way where they are erected into the ship.

Erecting the Ship

There are various sequences used in erecting a ship, depending upon the type and size of the ship, the type of construction (riveted or welded), and facilities for subassembly. However, there are certain basic principles which must be adhered to and the following is a typical example of modern practice. The fundamental precept for erecting both subassemblies and the ship as a whole is to work from the center, progressing from inboard to outboard and simultaneously forward and aft. The first operation in building a ship is placing the flat and vertical keel sections on the building blocks and connecting the butts either by riveting or by welding. Next the double bottom sections are placed on each side of the keel, starting amidships and working forward and aft. The double bottom sections are jacked into position and welded or riveted to the keel. As soon as the double bottoms are in place, the main transverse strength bulkheads are erected in place. Generally some longitudinal deck girders and longitudinal bulkheads are placed next to steady the main transverse bulkheads in a fore-and-aft direction. The side framing and shell plating are then placed in position and fastened to the existing structure. The frames are connected to the double bottoms. As soon as the side shell is in place, the decks, beginning with the lowest, are placed in position and connected to the shell frames and to the transverse and longitudinal bulkheads.

If the vessel is to be armored against gunfire and bombs, the armor must be *worked into* the ship as the construction progresses. In vessels having light armored decks, such as cruisers, the deck is merely thickened and composed of armor plate. The heavy deck armor of a battleship, however, is placed on the ordinary steel deck. Since its great weight prevents it from shifting, it is seldom fastened to the deck plating. The individual armor plates are keyed together to form a cohesive whole. Heavy *belt armor* is installed on large naval vessels and it extends from several feet above to several feet below the waterline. These armor plates are hoisted into position and bolted to the shell plating. The whole armor belt is keyed together also.

As the building process progresses from amidships towards the ends, the stern frame assembly is erected and the double bottom and side shell are carried aft to join this assembly. The whole bow section is usually constructed at a subassembly point and placed in position rather late in the building schedule. The last steps in the pre-launching construction schedule are the installation of propeller shafts and machinery and the painting of the exterior of the vessel. Large vessels are usually from one-half to three-quarters complete when launched.



A SHIP UNDER CONSTRUCTION
Scene as the ship grows on the ways at Norfolk Naval Shipyard. A large battleship usually requires about three years from keel-laying to launching. The *Missouri's* keel was laid on 6 January 1941 and she was launched on 29 January 1944.

Launching

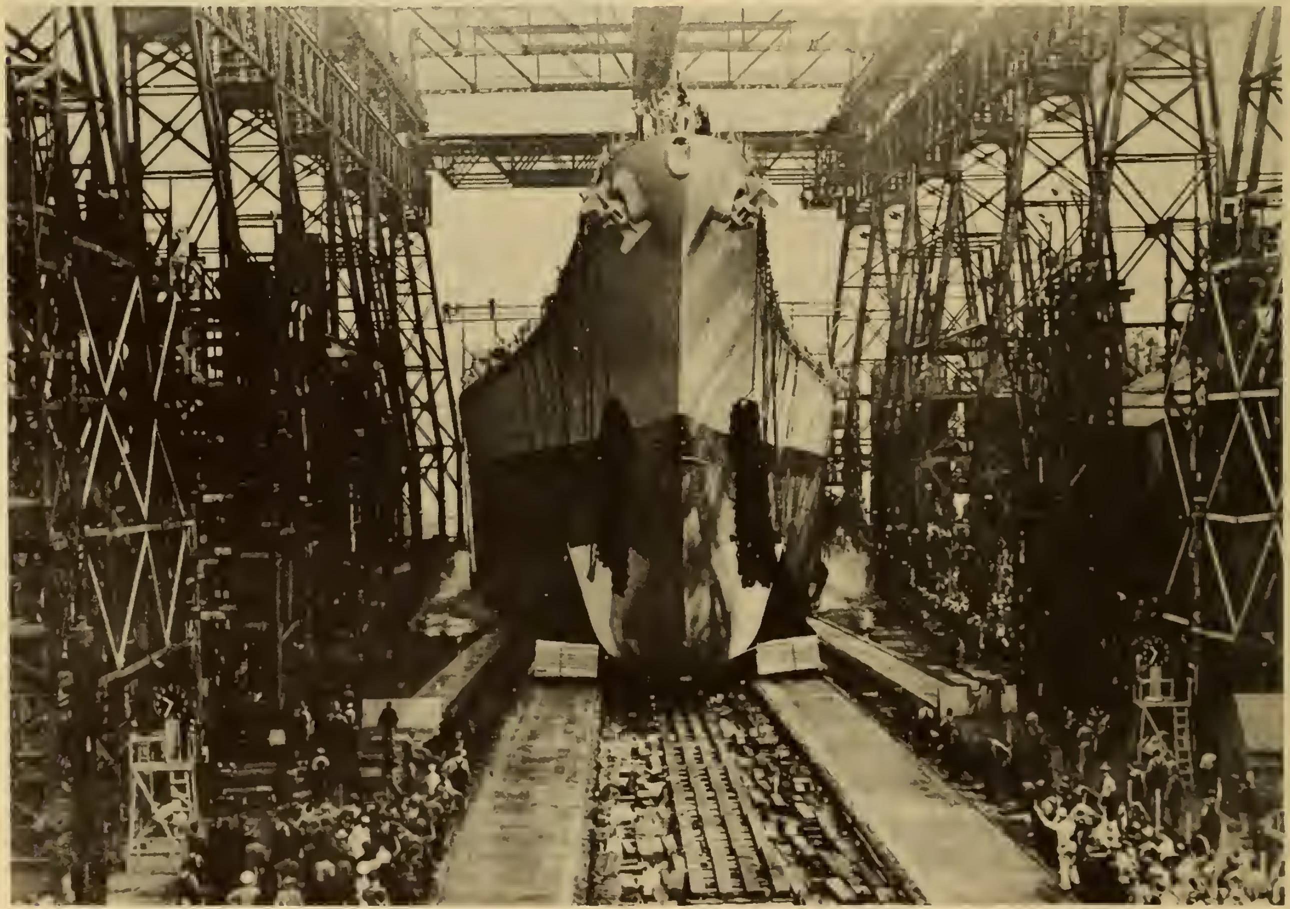
Even prior to the laying of the keel, launching calculations are undertaken in the drafting room in order to determine the best position on the ways for building the ship, as well as the method of launching and the proper time to launch. Several months before launching, the shipwrights begin the preparation of the launching ways and all the preparatory work required to shift the weight of the vessel from the keel blocks, shores, and cribs to the launching ways.

When the USS *Wisconsin* was launched in 1943 the enormous task required a total of 62 distinct operations beginning more than 24 hours before the ship slid down the ways. The task involved transferring the weight of the huge ship from hundreds of timber shores and keel blocks to the ways. There were two types of ways, fixed and sliding. The *Wisconsin* rode down into the water on four fixed ways, each serving as a track. Mounted atop the fixed ways were the sliding ways, which served much the role of runners on a sled. The sliding ways were secured to the ship by temporary fastenings. Months before the launching, the fixed ways were lubricated with nearly 100,000 pounds of heavy grease to ease the big ship on her first trip.

One of the first phases of transferring the *Wisconsin's* weight from the timbers shoring her up to the sliding ways was "wedging up." This consisted of driving scores of long wooden wedges under the ship, at right angles to her, in such a way as to force the sliding ways hard up under the ship and hard down on the fixed ways. Meanwhile, more than a thousand workmen gradually removed the shoring and cribbing in accordance with carefully timed plans made several months earlier.

The *Wisconsin* was now ready to slide down the incline of the fixed ways by her own sheer weight. Holding her back, however, was a series of six mammoth triggers whose upper ends were hooked into the sliding ways. The signal to launch was flashed simultaneously at the sponsor's stand, high above the waiting throng, and in the trigger pit. With the releasing of the triggers, the ship was off. The *Wisconsin* took an estimated 30 seconds to slide into the water.

Sponsors. The name of the ship is chosen by the Secretary of the Navy, upon recommendation of the Chief of Naval Personnel. (The system followed in



LAUNCHING OF USS *IOWA*

"May she bear the sword to bring peace on earth among the Nations." This phrase is taken from the prayer usually spoken by a chaplain at the ship's launching. From the earliest days, launching ceremonies have had some religious aspect.

naming ships is described in the Appendix.) The sponsor for the vessel is designated by the Secretary of the Navy in accordance with naval customs and tradition. In the selection of sponsors for battleships, the governor of the state is usually extended an invitation to nominate a woman to christen the ship. The mayor of a city is customarily extended an invitation to nominate a sponsor for the cruiser named in honor of his city. Aircraft carriers, for the most part, are sponsored by the wives of naval personnel associated with aviation; and submarines by wives of personnel associated with the submarine service. Sponsors for vessels named in honor of personnel are usually the nearest female relatives of the persons for whom those vessels are named. The commandants of naval districts have been authorized to designate sponsors for some of the smaller vessels built within their districts and to consider among others the wives and daughters of shipyard personnel.

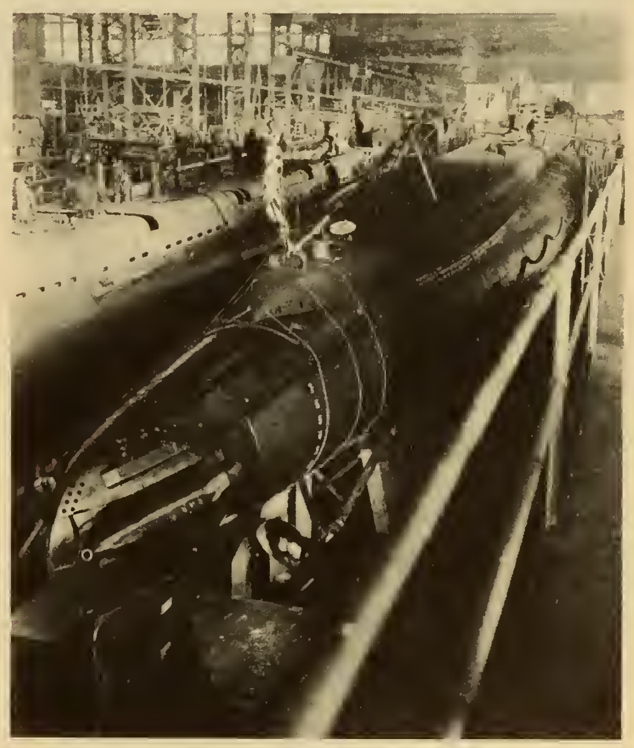
The Ceremonies. At the time of the launching, the sponsor, and naval officers, officials of shipbuilding companies, and the commandant, or his representative, of the naval district in which the vessel is being built, assemble on a flag-decorated platform erected for the occasion at the bow of the ship. If a battleship is being launched, very often the governor of the state which is honored delivers one of the several addresses. Usually the chaplain of the naval shipyard, or district, is a member of the party, and just before the ship is started on her first journey, he offers a prayer for those who are responsible for our Government and the officers and men in our Navy. For the ship's future service, he asks, "May this new vessel of our Navy be guarded by Thy gracious Providence and care. May she bear the sword to bring peace on earth among the Nations. Let her be a terror to those who do evil and a defense to those who do well."

The band plays the national anthem, flags and pennants wave, and as the ship begins to move, the sponsor breaks upon her bow a gaily wrapped bottle of wine or water, saying, "I name you —— in the name of the United States," and frequently adds, "May success always attend you."

At the launching of several of our aircraft carriers, pigeons were released during the christening ceremonies, and squadrons of airplanes saluted from the sky. Frequently blossoms of the chosen flower of the state honored are showered upon the battleship.

Fitting Out

After the christening, the ship continues to move down the ways until she slips into the water, gliding slower and slower until she loses almost all motion. Then the tugs rush to her sides and tow her to a fitting-out pier. Here giant cranes move the heavy machinery into the ship. The superstructure, masts, guns, turrets, and other equipment are placed on board. Machinery which was not previously installed is placed in position. Living quarters, galleys, messing compartments, and other spaces are painted and fitted with furniture and equipment. There are innumerable items that must be installed on board before a ship is pronounced complete and ready for commissioning. Five or six months may elapse between launching and commissioning of larger ships.



PREPARING TO LAUNCH A SUBMARINE
This is a stern view of the submarine USS *Capelin* (SS289) before launching at the Naval Shipyard, Portsmouth, New Hampshire.

"BOATSWAIN, SET THE WATCH!"
The cruiser *Worcester* is commissioned at the Philadelphia Naval Shipyard. First watch is set immediately after the commissioning.

Commissioning

When the ship is ready for commissioning, personnel, not already on hand, who are to form her crew, are ordered to the local naval shipyard by the Navy Department. Orders are given to the commandant of the naval district, or of the naval shipyard, where she is building, to place her in commission.

On the day appointed, her officers and crew in dress uniform assemble on her decks. The commandant and members of his staff are present. While the band plays and all stand at attention, the commandant orders the national ensign hoisted to designate her as a ship in the official service of the Government. The commission pennant is unfurled at the mainmast.

Then the commandant formally turns the ship over to the prospective commanding officer. The latter reads aloud his orders from the Navy Department to command the ship. His first order is, "Set the watch." The officers and crew take their stations in the new ship.

After a short period of preparation the ship is ready for the shakedown cruise which will last several weeks. The ship will be tested for seaworthiness, speed, endurance, and ability to maneuver, and all of her equipment will be adjusted to suit operating conditions. The shakedown cruise is also utilized for training the ship's personnel. Upon completion of this cruise, the ship returns to the outfitting yard for further changes and additions as found necessary. Most ships built on the east coast then proceed to Rockland, Maine, for standardization trials over the measured mile. These are conducted by the Board of Inspection and Survey. Careful checks are made of the vessel's fuel consumption, speeds, propeller revolutions, and other factors to set a standard for the service operation. Upon completion of these trials, and any additional minor items of work found to be necessary, the vessel is ready to leave the outfitting yard and join the fleet.

COMPARTMENTATION

Dual Purpose

The decks and bulkheads of a vessel divide the interior into many watertight rooms or *compartments.* In a cargo vessel there are few decks and the bulkheads are widely spaced. The resulting compartments are designated by their primary purpose, such as *cargo holds,* which are large enough to accommodate, in some cases, a huge amount of cargo. Passenger vessels have smaller holds, the remainder of the space being divided by decks and bulkheads into smaller living compartments for passengers. Naval vessels are more extensively compartmented than merchant vessels as a whole. This is because their watertight compartmentation is more than a matter of dividing or segregating the various activities aboard a ship. The ability of a naval vessel to withstand damage depends to a large part upon its compartmentation. In case of damage, the watertight boundaries of the compartments restrict the flooding waters, standing as a barrier between them and the undamaged portion of the vessel. The more minute the compartmentation, the smaller is the amount of sea water which will enter the vessel through a rupture in its shell plating. In naval vessels this compartmentation reaches its highest development in the battleship, which of all men-of-war is capable of taking the most punishment.

Watertight Integrity

In the previous paragraph only watertight compartments were discussed. If a compartment is not watertight, its usefulness as a barrier to further flooding of the vessel is nil. This quality of watertightness is known as watertight integrity. If high, the watertight integrity of a compartment will be effective in limiting the extent of flooding due to damage; if it is low, it may be useless. The battle to maintain the watertight integrity of the ship as a whole is a complicated and never-ceasing one. The waking hours of a considerable number of any naval ship's crew are concerned in one way or another with the ceaseless patrol and inspection that are necessary to keep the watertight integrity high and the vessel in battle trim.

Boundaries of each watertight compartment are pierced not only by the more obvious doors and hatches, but by countless holes to accommodate water, steam, oil and air piping, electric cables, ventilation ducts,. and other necessary utilities. Each such hole must be plugged by a *stuffing tube, pipe spool,* or other device to prevent water from leaking in around piping and cables. Piping and ventilation ducts must be equipped with cutoff valves or other closures at each main bulkhead in case the piping or duct itself is damaged. Rigid restrictions against opening watertight doors or hatches during action or in dangerous waters are enforced. All of these "defensive" precautions must be taken to insure the full use of the fighting qualities of the vessel and the complete destruction of the enemy.

Designation

From forward aft, United States naval vessels are cut by transverse bulkheads into three or four divisions labelled A, B, C, and D. In a three-division ship, Division A extends from the stem to the forward transverse bulkhead of the forward machinery compartment. Division B includes the space from that bulkhead to the after bulkhead of the after machinery compartment. Division C comprises the remaining space aft. In a four-division ship, the boiler and engine room compartments are divided into two parts, Divisions B and C, with Division D comprising the remaining space aft. Note that while the ship is considered to have only three or four main divisions, this does not mean that there are only three or four transverse bulkheads. There are many others, all supporting the structure of the vessel and contributing to its compartmentation and watertight integrity.

All compartments on board ship are designated by various letters and numbers to indicate their location and use. For example, a compartment might have the designation B-215-L. The first letter indicates the division in which the compartment is located. The first numeral of the three-numeral group shows what deck it is on, and the last two numerals of the group show the number of the compartment within the division. Odd numbers are used for compartments on the starboard side while those on the port side are shown by even numbers. In this particular case, the compartment is the eighth in Division B from the forward transverse bulkhead on the starboard side and on the second deck.

As a general rule, compartments on the main deck are numbered from 101 to 199 in each division beginning at the forward end of the division. Compartments on the second deck would be in the two hundred series, those on the third deck in the three hundred series, those on the superstructure deck from 001 to 099. The series 901 to 999 is used for double-bottom compartments. Compartments on half decks have the same numeral as the deck below but are indicated by the letter H which is added after the division letter; i.e., BH-215-L.

To define further the contents or use of a compartment, the numeral group is followed by a designating letter. In the example cited, the letter L stands for living quarters. Other letters used and their meanings are as follows:

M—ammunition
E—machinery
W—water
F—fuel
V—void
B—guns
A—storeroom

For compartments extending from the inner bottom up through two or more decks, the designation is the division letter followed by a number in the series 1 to 100. Examples of compartments of this type would be the engine room, fireroom, peak tank, or cargo hold. Thus a boiler room might have the designation B-1 or C-1.

Every door, hatch, manhole, or other means of ingress to a compartment has a metal label on it which gives the door's number and location plus a description of what is in the compartment and the compartment's letter and numeral designation just discussed.

An example is:

W. T. D. 4-16-6
C. P. O. Stores
A-412-A

W.T.D. stands for watertight door. The "4" indicates that it is on the fourth deck, the "16" that it is just abaft the sixteenth frame, and the "6" that it is the third opening, from inboard out, on the port side. You would also know that the compartment was a storeroom for C.P.O.'s located in Division A and that it was the sixth compartment on the port side from the bow.

CHAPTER 11

EXTERNAL EQUIPMENT OF SHIPS

THE HULL

General Terms

In the description of a ship, the term *hull* usually includes her interior framework, inside and outside plating or planking, decks and bulkheads, and any deckhouses (but does not include masts, rigging, equipment, and items generally classed as *superstructure*). For the purpose of this section we shall consider the hull as a single watertight shape covered on top with a deck, or with parts of several decks, called roughly the *weather deck*. The right-hand side of the ship when looking from aft forward is the *starboard* side. The opposite side is the *port* side. *Amidships* is in the vicinity of the middle portion of a vessel as distinguished from her ends. The term is used to convey the idea of general locality but not that of definite extent. The edges of the weather deck from the bow to the stern are usually guarded by light cables or chains called *life lines*, or by an extension of the shell plating of the ship above the deck edge, called *bulwarks*. The *waterline* is the line to which a hull sinks when in the water. The vertical distance from this line to the lowest exposed deck edge is the *freeboard*.

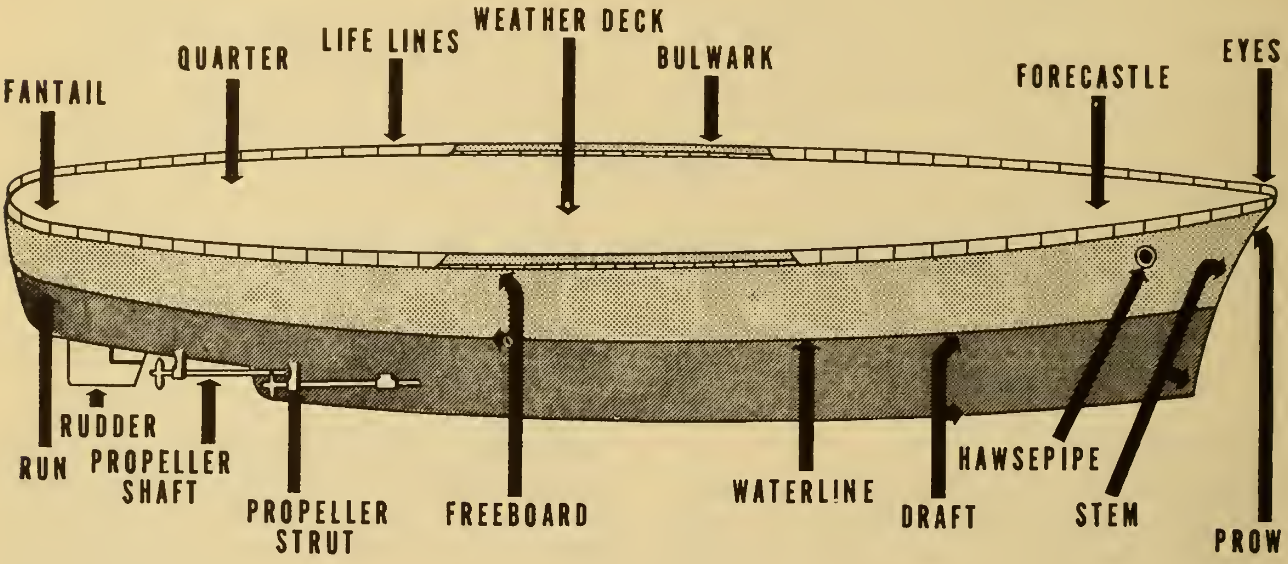
Draft is the depth to which the hull sinks in the water. Since the drafts forward and aft may differ under various conditions of loading, numbers are painted on the sides of the ship at both bow and stern to measure the drafts. The relation between the drafts forward and aft is called the *trim*. Most ships are constructed in such a way that these two drafts are equal when they are *in trim*. (Trim is the angle to the horizontal in which a vessel rides.) Some vessels, notably landing craft, may be designed to have a much smaller draft forward than aft. When unusual conditions of loading or underwater damage cause a ship to be *out of trim*, she is said to be "down by the head" or "down by the stern." Trim may be adjusted by filling or emptying *peak tanks* in the bow and stern of the ship.

Fore Part of the Hull

The general area of the weather deck in the forward part of the ship is the *forecastle*. The nearly vertical structural member of the hull at the bow is called the *stem*. The bow structure above the waterline is known as the *prow*. The part of the weather deck nearest the stem is called the *eyes* of the ship. (Under conditions of reduced visibility at sea a special lookout is normally stationed in the eyes of the ship.)

After Part of the Hull

The *quarterdeck* is that part of the main or other appropriate deck set aside for the conduct of official and ceremonial functions. It is normally aft. The deck area at the stern of the ship is the *fantail*. The part of the ship which literally overhangs the water and extends abaft the rudder is the *overhang*. In the after part of the vessel the hull usually narrows considerably; this narrowing is the *run* of the ship. Below the waterline are the *propeller shafts*, the *propellers* or *screws*, and the *rudder*. In multiple-screw ships, the propeller shafts project to such an extent that they must be supported by braces extending from the hull, called *propeller struts*. To protect the propellers, metal



HULL NOMENCLATURE
The term "hull" includes the ship's interior framework, inside and outside plating or planking, decks, bulkheads, and deck-houses.

frames called *propeller guards* are built out from the hull above the water. Otherwise, because of the run of the ship, the screws might be damaged when the ship is close by a pier.

ORDNANCE EQUIPMENT

Ship and Plane Weapons

The types and amount of ordnance equipment carried by a ship or aircraft are determined by the purpose for which it was built. While most of the ordnance equipment now in use employs the same principles which have been known for many years, it has nevertheless been considerably improved upon to adapt it to the needs of modern warfare. Perhaps one of the greatest advances has been in the accuracy with which the missiles are projected.

The principal weapons used by naval vessels and aircraft are: guns, torpedoes, mines, depth charges, bombs, and rockets.

Guns

Of the weapons mentioned above, the gun is the oldest in point of service in our Navy, and is the one most frequently employed aboard ship. Improvements in the construction of guns and in the explosives used with them in the last century, particularly since 1900, have revolutionized gunnery by tremendously increasing the destructive power and effective range of these naval weapons. During the Revolutionary War, for example, our vessels fought at ranges of only several hundred yards, using cast-iron guns without sights. These were inaccurate and threw solid shot which, on striking the target, failed in most cases to penetrate the side. Modern guns hurl explosive shells weighing up to more than a ton. The range of some of the larger guns is as great as 20 miles.

Size. The size of a naval gun is indicated by its caliber (the diameter of the bore) and by its length in calibers. Thus, the designation *5″/38 cal.* indicates that the gun has a bore diameter of 5 inches and is 38 × 5 inches or 190 inches long. Guns in common use in our Navy range from the 20-mm machine gun to the 16″/50 caliber gun which is over 66 feet in

THE BIG GUNS ROAR
A battleship of the *Iowa* class fires a broadside.

length and throws a shell weighing 2700 pounds. Typical examples are: small caliber — 20 mm, 40 mm; intermediate caliber — 3″/50, 5″/38; major caliber — 6″/47, 8″/55, 16″/50.

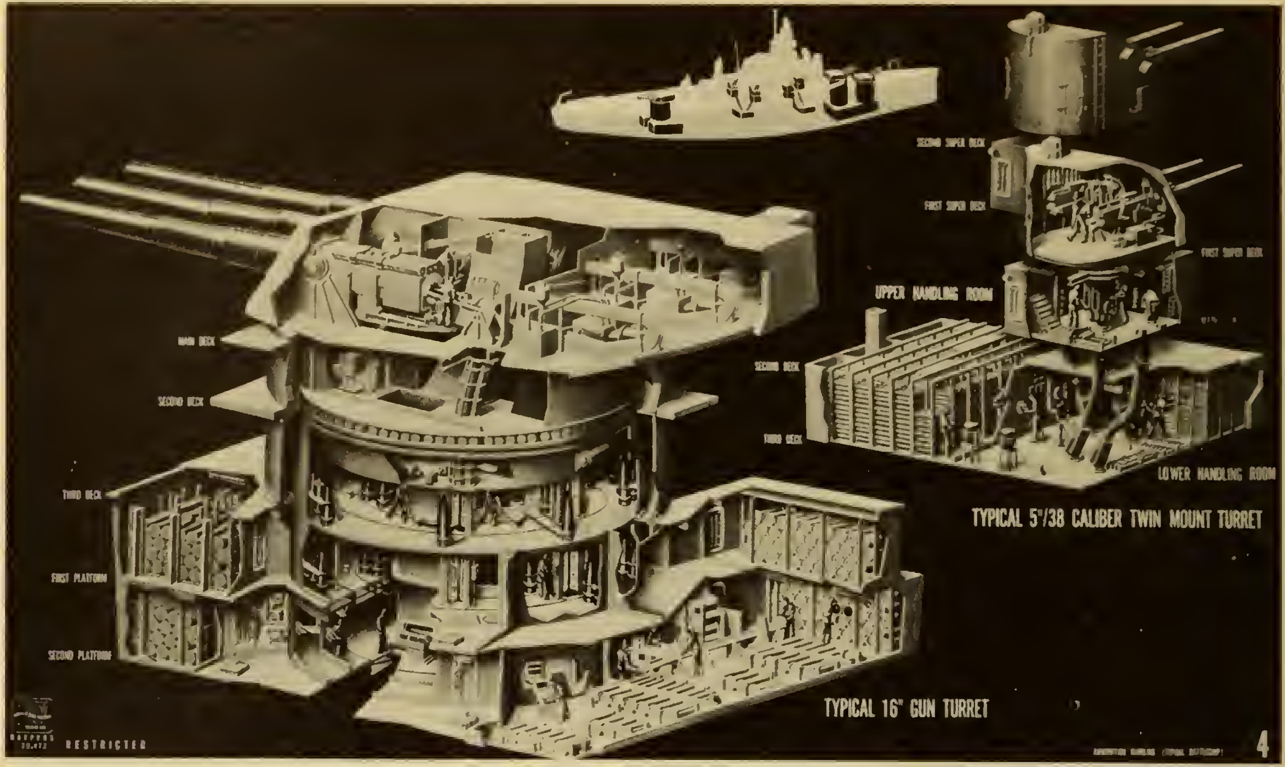
Classification. Guns may be classified according to the method of loading and firing. Large guns are nonautomatic; the breech must be opened after each round, the projectile and powder placed in the chamber, and the breech closed before firing. Guns of intermediate caliber, such as the 5-inch or 6-inch guns, are semiautomatic; the firing of one round causes the breech to open, the empty cartridge case to be ejected, and the firing mechanism to cock; placing the new round in the chamber closes the breech, and the gun is ready to fire. Smaller guns are completely automatic and are usually referred to as machine guns; in these the firing is continuous, once the firing key is closed.

Mountings. Large guns are usually mounted in *turrets,* boxlike structures of armor enclosing the breech end of from two to four guns. The turret rotates upon a *barbette,* a fixed circular tube of armor extending down to the armored deck. The barbette contains the ammunition-handling rooms, hoists, and the revolving machinery for the turret.

Smaller guns are housed in *gun mounts,* which are of two types, open and closed. The latter type resembles a turret but does not have an armored barbette.

The mounts or turrets of all naval guns except the smallest are trained (rotated in the deck plane) and the guns are elevated by electric or electric-hydraulic power drives. These are usually automatic and move the gun to a position designated by a fire-control system.

Batteries. A group of guns of the same caliber and


SECOND SUPER DECK
FIRST SUPER DECK
FIRST SUPER DECK
UPPER HANDLING ROOM
MAIN DECK
SECOND DECK
SECOND DECK
THIRD DECK
THIRD DECK
FIRST PLATFORM
SECOND PLATFORM
LOWER HANDLING ROOM
TYPICAL 5"/38 CALIBER TWIN MOUNT TURRET
TYPICAL 16" GUN TURRET
RESTRICTED
4

AMMUNITION-HANDLING DIAGRAM

Providing the guns with ammunition is an important function. Each shell passes through an elaborate maze before it reaches the gun.

usually controlled and fired as a group is known as a battery. Batteries are classified as follows:

1. *Main battery:* guns of the largest caliber aboard ship, and used primarily for fire against surface targets.

2. *Secondary battery:* guns of smaller caliber than the main battery, and also used against surface targets. This term is rapidly disappearing from use since no true secondary batteries remain in any but the oldest ships.

3. *Dual-purpose battery:* a battery, usually of intermediate caliber guns, used against either air or surface targets.

4. *Antiaircraft battery:* a battery of small-caliber guns used against air targets only. This battery is usually referred to as the machine-gun battery and may be further divided into the heavy machine-gun and the light machine-gun batteries.

Ships of various classes may have all or only some of these batteries. A typical modern battleship, for example, has a main battery of nine 16″/50-cal. guns in three 3-gun turrets, a dual-purpose battery of twenty 5″/38-cal. guns in 10 twin mounts, and an antiaircraft battery of numerous 40-mm and 20-mm machine guns. A destroyer has no main battery, a dual-purpose battery of four to six 5″/38-cal. guns, and several 40-mm and 20-mm machine guns. In this case, the dual-purpose battery is frequently spoken of as the main battery since it comprises the largest guns aboard.

Fire Control. Fire control, in a broad sense, refers to the entire process of utilizing a ship's armament. It involves the material, personnel, methods, communications, and organization necessary to inflict upon the enemy maximum destruction in minimum time. Gunfire control refers to the control of gunfire; torpedo fire control to the control of the launching of torpedoes, and so on.

Although cannon have been used for centuries, fire control in anything approaching its present form is a comparatively new development in gunnery. At the close of the 19th century, fire control was beginning to take on the aspects of a science. However, it is noteworthy that the only fire-control instrument, other than sights, in use at that time was the *stadimeter*, adopted in 1898 as a range-finding instrument.

As improved fire-control methods and equipment developed, the accuracy of gunfire, and consequently the effective ranges, increased tremendously. Before 1900, most engagements were at short range, within several hundred yards. At the Battle of Tsushima in 1905 (Russo-Japanese War), the range varied between about 4,000 and 6,000 yards. By 1910 the United States Navy was holding battle practice at 12,000 yards with reasonable accuracy. At the Dogger Bank engagement between England and Germany in 1915, the opening range was between 18,000 and 20,000 yards. At the end of World War I, long-range practices were conducted at about 24,000 yards. Recent developments in ranging and computing instruments and in gun construction have raised the range limits to well over 35,000 yards.

The development of the airplane and antiaircraft defense made the fire-control problem more complex; the airplane can move in three dimensions, the surface ship in only two. Furthermore, the speed of the plane makes the problem more difficult and also gives the defending ship less time to fire. By the end of World War II, antiaircraft fire control had reached the point where our large ships could defend themselves against simultaneous attack by several aircraft with good probability of shooting down all of them.

Fire-control Equipment. Fire-control equipment must solve a difficult problem. It must direct the guns to hit a moving target with a projectile that takes a considerable length of time to arrive at its destination. Accordingly, the gun cannot be aimed at the point where the target is when detected; it must aim at the point where the target will be when the projectile gets there, that is, the predicted position of the target. Furthermore, the path of the projectile is not a straight line but is curved by gravity, and the projectile is acted on by wind, variations in atmospheric density, and other forces. In addition, the guns and the fire-control equipment are mounted on a ship that is steaming along its course and is rolling and pitching.

The fire-control equipment that solves this problem is usually known as a *gunfire-control system.* There are frequently more than one of these systems for each battery, and the whole battery may be controlled by one system or may be broken down into smaller groups, each controlled by a separate system.

FIRE CONTROL IS NECESSARY TO BATTLE EFFICIENCY
A pointer on a 40-mm mount on the USS *Leyte.*

A gunfire-control system generally consists of two parts, one above deck and the other below deck in a sheltered and protected position. The above-deck portion consists principally of a *gun director* which acts as the eyes of the battery. It is trained and elevated so that its optics and radar are always directed toward the target, thus establishing a line of sight. Directors vary in size and complexity from very large rotating structures with five or six men inside the director and with complex electrical driving mechanisms, to small, hand-operated devices, often little more than a pair of handlebars controlling some sort of sight.

The introduction of radar into the fire-control system has greatly enhanced its flexibility and accuracy by providing more accurate range and nearly as good target direction data as the best optics. Radar operates at night and under poor visibility conditions when the use of optics is impracticable.

The below-deck components of the system usually comprise a *computer* and other related equipment, although the computer is sometimes part of the director. To compute the orders necessary for aiming the guns properly to hit the target, the computer must use the data concerning the position of the director, plus in some cases the rate of movement of the director. It must also use other quantities dependent upon the wind, the motion of the ship and the atmosphere, and information concerning the projectile path which is built into the computer. These orders are transmitted directly to the power drives of the gun mounts or turrets. Computers make use of complex electrical and mechanical components to perform continuous complex calculations. Some are entirely mechanical, with quantities represented by positions of shafts; others are electromechanical, with quantities represented both by positions and by voltages.

Gun Ammunition. All gun ammunition is made up essentially of two parts: the *projectile* and the *propelling charge.* In all guns the propelling charge is ignited by means of a primer which is fired either electrically or by percussion. The rapidly expanding gases liberated by the burning propellant, having no other means of dissipation, force the projectile from the gun barrel.

Gun ammunition is divided into three classes, according to the relationship between the powder charge and the projectile. The classes are:

1. *Fixed ammunition:* The projectile is secured to a cartridge case containing the propellant and fitted with the primer. A gun firing this type of ammunition is loaded in one operation. All ammunition up to that for the 5-inch guns is included in this type.

2. *Semi-fixed ammunition:* The projectile is separate from the propellant charge which is contained in a cartridge case fitted with the primer. Ammunition for 5-inch, 6-inch, and some 8-inch guns is of this type.

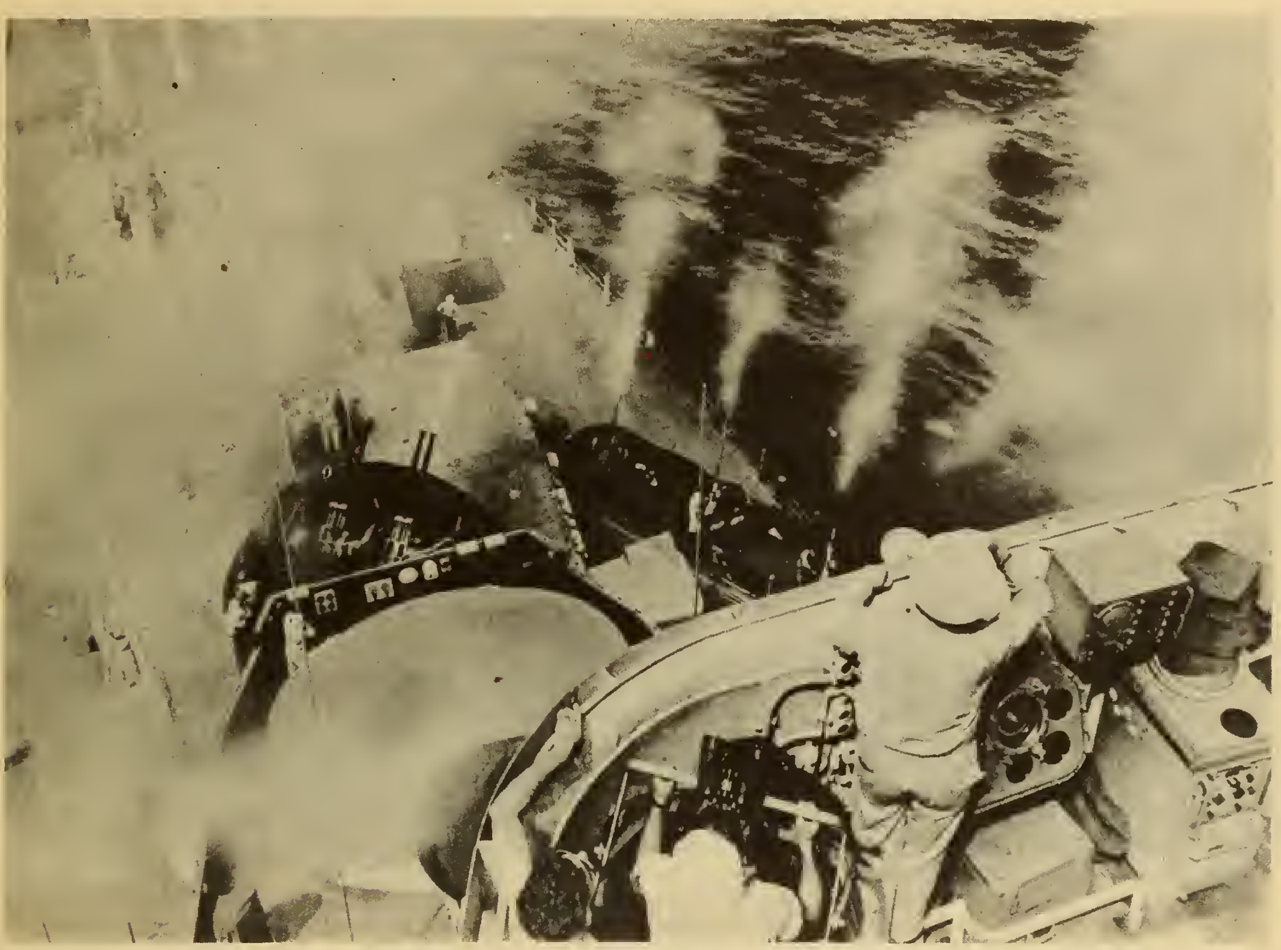
3. *Separate-loading ammunition:* The projectile is separate from the propelling charge as in semi-fixed ammunition, but in this type the powder is contained in silk bags and the primer is inserted into the chamber of the gun prior to firing. The loading operation is performed in three steps: projectile, powder charge, and primer. Eight-inch and larger guns fire separate-loading ammunition.

The powder charges for gun ammunition are essentially the same in composition, varying, according to caliber of gun, in weight of charge, size of the individual powder grains, and the type of containers; but the projectiles for each caliber of gun vary with the type of target against which they are to be used. For our purpose they may be classified either as armor piercing or as high capacity. The former are designed to pierce heavy, face-hardened armor, and the fuze carried in the base of the projectile is so constructed that its action is delayed a fraction of a second to allow time for penetration before detonation. The high-capacity shell, on the other hand, has walls only sufficiently thick to withstand the shock of firing. Since the high-capacity projectiles do not have to withstand the heavy shock of impact without bursting, a more sensitive explosive may be used and, because the walls are thinner, greater space is available for it. In these projectiles, the wall is thick enough to produce destructive projectile fragments and may be fuzed to explode either on contact or at a predetermined time interval.

Torpedoes

The first effective weapons to bear the name *torpedo* were actually large bombs secured to the end of a spar which was carried on the bow of the attacking vessel, to be placed eventually against the side of the bottom of the target and exploded. However, the real forerunner of the modern torpedo was invented late in the 19th century and embodied a self-contained means of propulsion, satisfying the present-day definition of a torpedo, namely, a self-propelled explosive missile whose trajectory (or path of flight) in water is influenced by a mechanism incorporated in the missile.

Most modern torpedoes employ an air-alcohol-water superheated gas turbine method of propulsion. This system was used in the torpedoes employed in World War I and in the majority of those used in World War II. Gradually, however, this type of torpedo is being replaced either by electrical (battery-driven) or chemical torpedoes which are favored because of their wakeless characteristics. The majority of modern torpedoes are controlled through a predetermined



BATTLE PRACTICE IN PEACETIME
The guns ond the men who mon them must be kept in the best of condition.

course by means of a gyro, but during the past war, developments of acoustic homing weapons brought forth a torpedo which could "home" on the target under the influence of the target's noise.

Speed and accuracy of torpedoes have been improved considerably and further developments along this line are in process. The explosive charge carried by these weapons has been increased to as high as 1,100 pounds and the means of detonating this charge incorporates magnetic mechanisms which fire the charge when influenced by the magnetic field of the target.

Torpedo Tubes. For torpedo firing from destroyers, torpedo tube mounts consisting of five individual tubes or barrels are now used. These mounts are usually located amidships on the centerline and are capable of being trained as desired.

For firing from submarines, stationary torpedo tubes are installed in both the forward and after sections of the submarine, usually comprising four tubes in the after section and six tubes in the forward section, all installed in a fore-and-aft direction.

Provision has also been made for launching torpedoes from various types of aircraft.

Mines

A mine may be defined as an underwater explosive weapon which is placed in a planned position to await the arrival of its target. As originally employed, mines were normally laid by ships called minelayers which

THE DEPTH CHARGE IS A HIGHLY SPECIALIZED WEAPON
A cutter forces a Nazi submarine to surface by using depth charges.

were especially designed for that purpose. However, in modern warfare, the use of aircraft in minelaying has assumed a major role since aircraft possess certain advantages such as speed of operation, accessibility to harbors, and the ability to avoid detection. Mines may also be planted by destroyers, submarines, and patrol craft.

The purpose of mines is to create underwater and internal damage to ships as a result of their explosion. Although the early type of mine was almost exclusively designed for detonation on contact, modern mines are designed for sonic or magnetic detonation as well. Contact mines are set off on direct contact with the hull of the ship; sonic mines are detonated by the effect of sound waves from the target; and magnetic mines are detonated by the action on the mechanism of the change in the magnetic field caused by the ship.

As a defense against mines, minesweepers are used to clear away fields of contact mines, an operation that is performed by means of cable cutters which are streamed from the sides of the ship. Such methods are not practicable against magnetic or sonic mines. As a countermeasure against magnetic mines, the ships themselves are either depermed or degaussed to neutralize their magnetic field and thus prevent activation of the mine mechanism. Against sonic mines, some degree of success in defense has been obtained by use of strong sound signals or explosion of charges in order to detonate the sonic mines prior to the arrival of the ship over the mines.

The use of mines in World War II played an important role in the reduction of enemy shipping.

Depth Charges

The depth charge is a highly specialized weapon used almost exclusively for combating submarines. It is carried by destroyers, destroyer escorts, patrol craft, subchasers, and other vessels likely to engage submarines. Depth charges were first used in 1916 and even then proved very effective against submarines.

The depth charge is included in bomb-type ammunition. It consists essentially of a heavy charge of TNT in a thin-walled case which is fitted with a mechanism designed to detonate the charge either at a predetermined depth, in which case water pressure is the actuating medium, or by magnetic or acoustic influence caused by proximity to the submarine's hull. Depth-charge attacks are usually made in conjunction with the use of sound-detecting gear. The depth charges, when launched from ships, are rolled into the water from inclined racks, called depth-charge release tracks, which are installed on the fantail of the attacking vessel, or are projected from special guns that throw them clear of the vessel's side. The depth charge has proved to be an effective weapon against submarines and has, in addition to its destructive effect, the ability to affect adversely the morale of personnel aboard the submarine.

Aircraft Bombs

Aircraft bombs, although used to some extent in World War II, are a comparatively new development in ordnance. These bombs are classified as offensive weapons and vary widely in size, construction, content, and purpose.

There are a number of types of aircraft bombs: (1) armor piercing, which have a heavy case filled with high explosive amounting to approximately 15 percent of the total weight; (2) general purpose, which are 50 percent high explosive; (3) depth bombs, 70 percent high explosive; and (4) for special purposes, fragmentation, incendiary, and chemical bombs. The construction of bombs varies with the type of bomb and the amount of explosive contained. An armor-piercing bomb has comparatively thick walls to assist in penetration while the depth bomb has very thin walls to provide a maximum loading of explosive.

Specialized results may be achieved by varying the fuzing; for example, penetration may be obtained by a delay fuze, a surface blast by instantaneous fuzing, and underwater detonation by a fuze activated by hydrostatic pressure.

While explosive bombs will cause fires if conditions are favorable, the true incendiary bomb is quite small and is loaded with material that cannot be extinguished by ordinary means once it starts to burn.

Bombs carried by aircraft are used to inflict damage on surface vessels, submarines, and land areas. Their development during recent years has been very rapid and there is no question of their effectiveness during the past war.

Rockets

Although rockets were not used in combat by our Navy until early in 1942, they are not new weapons to the military world. Indeed, they were employed successfully more than 700 years ago.

In the 19th century, the British revived rockets as war weapons, and rocket ships were used when they attacked Fort McHenry at Baltimore late in the War of 1812. Hidden batteries sunk one of the rocket ships and forced others to retire. Their use in that engagement has been immortalized by Francis Scott Key in "The Star Spangled Banner" by the phrase, "the rockets' red glare." While success was achieved with rockets during the first half of the 19th century, the phenomenal improvements in artillery during the second half of that century resulted in the abandonment of this weapon.

The United States made great advances in rocket warfare during the war years. These missiles were first used operationally in the invasion of North Africa when 4″/5-caliber rockets were fired from multiple launchers on small landing craft. On this type, the head is thin walled, so that it not only has high explosive effect but is fragmentary and showers the surrounding area with shrapnel-like pieces of its casings. Rocket-equipped landing craft were used effectively in the invasions of Sicily, Italy, Normandy, and southern France, and in the amphibious assaults on Cape Gloucester, Kwajalein, Eniwetok, Saipan, Guam, the Palaus, the Philippines, and Okinawa. At Guam, in one instance, some 10,000 rockets were fired in less than five minutes.

The rockets presently used by the Navy may be classified into two types: those that are fin stabilized in flight, and those that are spin stabilized. They may

IN POINT OF SERVICE, THE GUN IS THE OLDEST WEAPON IN THE NAVY
A gun crew on the after deck fires during night action.

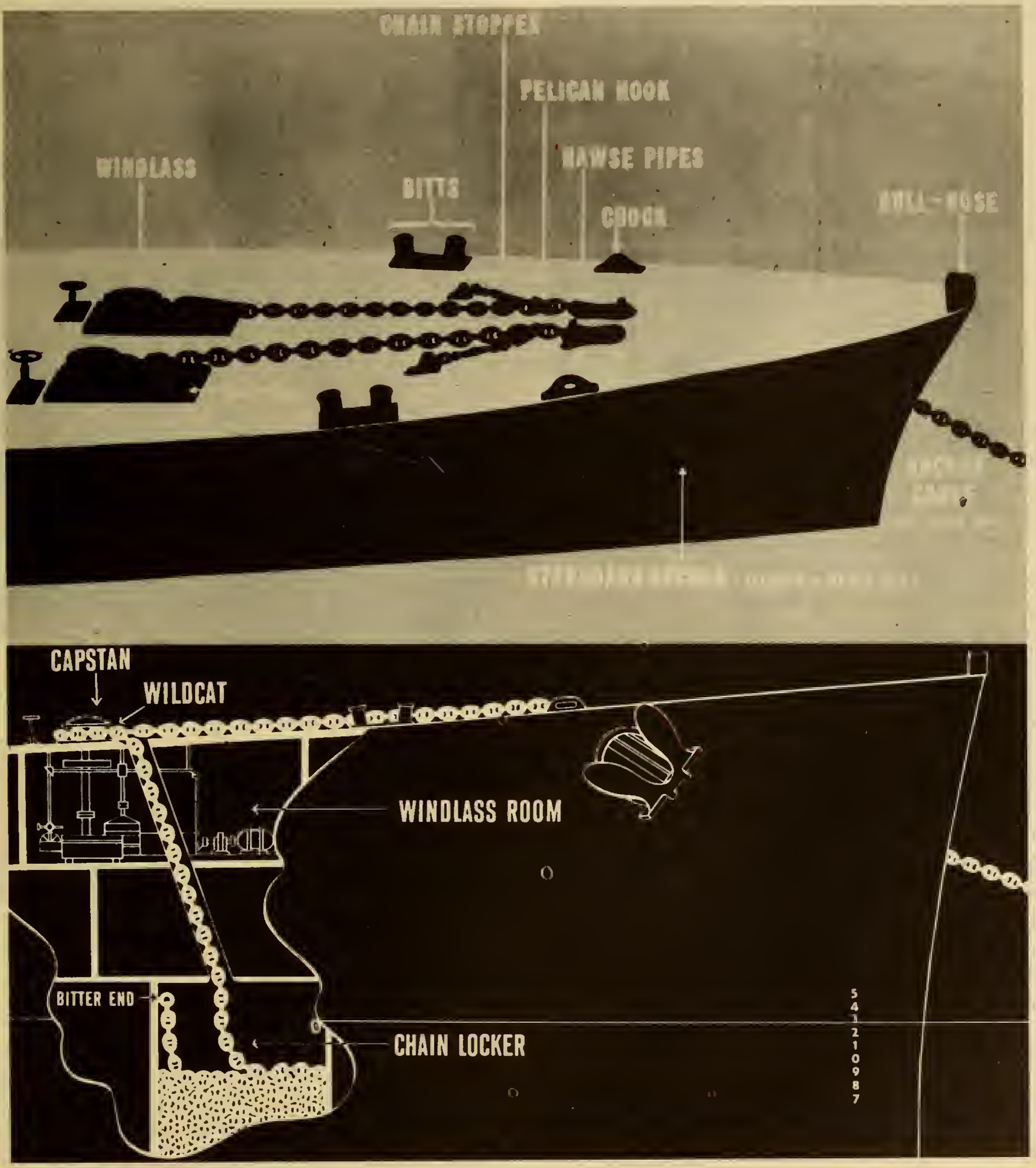
be further classified as surface-launched rockets and aircraft-launched rockets. Presently designed surface rockets have head diameters of 2.25 (training round), 3.5, 5.0, and 11.75 inches.

Rockets are not intended to supplant gunfire but are, rather, supplementary weapons. Their primary advantage is their lack of recoil which makes it possible to install heavy hitting power on small craft and aircraft which could not stand the shock of guns firing with equivalent destructiveness. While as simple in principle as an oldtime Fourth of July skyrocket, American rockets and launchers are artillery-like weapons. The rocket, with its two main components of head and motor, is the equivalent of a projectile plus the propellant powder charge. The rocket head carries varying amounts of high explosives or smoke-producing chemicals, or it may be made of solid steel, designed to penetrate thin-walled hulls below the waterline. The rocket motor extends aft of the head and, being assembled, flies with it in flight. It contains the propellant, a material that, when electrically ignited, generates expanding gas. This gas, on being forced through a restricted opening in the after end of the motor tube, exerts a force on the base of the head, thus propelling the rocket forward.

Equipped with rockets, fighter planes and small landing craft now have the striking power of artillery. In combating submarines, in attacking shipping, in slashing at enemy beach defenses to cover troop landings, in blasting shore installations and transportation facilities, their effectiveness has been well established.

Guided Missiles

A guided missile is one whose trajectory is influenced by a mechanism within the missile. During World War II, guided missiles first appeared in combat. These included the German types known as *V-1* and *V-2;* the United States Army ***azon*** and ***razon***, which were bombs that were radio controlled in one and two dimensions, respectively; and the United States Navy "Bat," a bomb-carrying, plane-launched glider that homed on its target by means of a radar transmitter-receiver carried in the glider. All major nations are working on further development of this type of weapon. As presently envisioned, these weapons will cover the field of range, accuracy, speed, and maneuverability from remotely controlled conventional type aircraft to supersonic intercontinental missiles with elaborate guidance and control systems.


CHAIN STOPPER
PELICAN HOOK
WINDLASS
BITTS
HAWSE PIPES
CHOCK
BULL-NOSE
CAPSTAN
WILDCAT
WINDLASS ROOM
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CHAIN LOCKER
5
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GROUND TACKLE

GROUND TACKLE

Definition

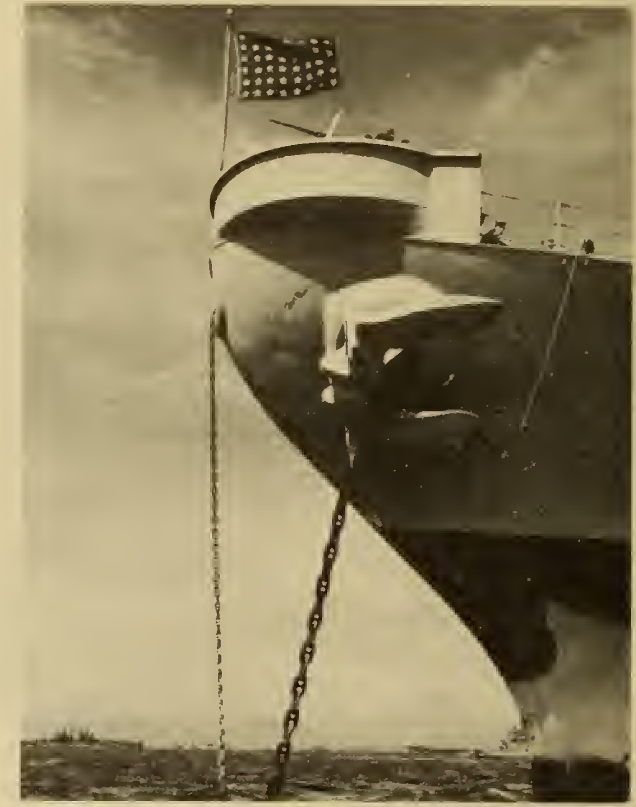
Ground tackle is a name given to the articles of equipment, considered collectively, used in connection with anchoring and mooring. A vessel is said to be *anchored* when one anchor is used to secure it. The term *moor* is used when a vessel is made fast to a mooring buoy, when it is swinging on a bight of a chain between two anchors in line, or when it is secured alongside a dock or another ship. The first lieutenant is responsible for the condition of the ground tackle on board ship and he keeps a complete log of the history of every piece of this important equipment.

Anchors and Anchor Chain

Anchors vary in weight from 30 pounds to about 30,000 pounds. Most ships carry two main anchors forward, the *starboard bower* and the *port bower*, though large ships may have in addition a *stem* anchor.

The *hawsepipes* are the tubes leading the anchor chain from the deck on which the windlass is located, down and forward through the vessel's bow plating. These openings are just abaft the stem on both sides of the ship. When a ship is underway or tied up to a pier the anchors are housed with their shanks in the hawsepipes and their *flukes* outside. The anchor chain runs freely through the hawsepipe when the anchor is let go.

Anchor chain and anchors are taken in by means of an anchor *windlass*. This consists of an engine, either steam or electric, which turns a shaft on which is mounted a *wildcat* or *chain grab*. The wildcat is a concave, drumlike contrivance with ridges around it, and these ridges are so shaped that they engage the links of the anchor chain. The wildcat is secured to the shaft for heaving the chain or paying out small amounts but is disconnected in dropping the anchor. When the ship is riding at anchor the wildcat is disconnected from the shaft and the brake is set taut. The anchor chain is secured on deck by a short length of chain called a *chain stopper* which is made fast to a permanent pad eye on the forecastle. The chain stopper is fitted with a slip hook, called a *pelican hook* for quick releasing of the anchor and chain. The chain passes from the wildcat down into the *chain locker* where it is stowed.



ANCHOR SECURED IN HAWSE PIPE
The anchor is housed when the ship is underway or tied up to a pier.

Wire ropes or manila *hawsers* are employed when a vessel is moored alongside a pier. On the ship these lines are secured to pairs of vertical metal heads called *bitts* and pass over the ship's side through metal *chocks*. They are secured on the pier to vertical posts called *bollards*.

Smaller lines may be secured to *cleats*. These are fittings of wood or metal with horns and are located in various appropriate places on board ship. The concave barrel-like portion of the windlass is called a *capstan* or *gypsy* and is used for handling anchor chains and hawsers.

BRIDGE ASSEMBLY

Introductory

Well forward on destroyers and nearly amidships on our new battleships is a high prominent structure which consists of deckhouses, platforms, ladders, and spaces for enclosing gun-, ship- and fire-control equipment. A major part of this assembly on all ships is the *bridge*. The bridge is the main control point and "nerve center" for the whole ship. All orders and commands come from the bridge while the ship is underway. It is the duty station of the captain and the officer of the deck. The latter at sea has an organization of considerable size to assist him in performing his duty and to feed information into this focal center. Telephonic or voice-tube communication enables him to keep in touch with all parts of the ship from his post.

Bridge Equipment

A list of the equipment to be found on the bridge of a modern warship would include: the *wheel* for steering the ship; the *binnacle,* a stand housing the magnetic compass; a *gyro-repeater* operated by the gyro-compass; the *engine order telegraph* or *annunciator* for transmitting orders to the engineers; a *fathometer* for measuring the depth of the water by sound waves; a *radio direction finder; switchboards* for operating lights and alarms; and devices for tracking submarines and surface craft. Navigational equipment such as sextants, charts, drawing instruments, and reference books may be stowed on the bridge; but more often it is kept in a separate compartment nearby, called the *chart house.* Around the enclosed bridge there is usually an open platform where lookouts and the officer in charge may determine the position of other ships, lighthouses, buoys, and so on.

Conning Tower

On battleships and cruisers there is a heavily armored structure called the conning tower which contains duplicates of all the control apparatus found on the bridge. It is located just forward of and slightly below the bridge and being the primary ship-control station during action is the battle station of the captain. Some ships have, in addition, a *battle bridge,* which is an open platform near the conning tower for the use of the commanding officer during engagements in which aircraft are employed.

AN ICE-BOUND SIGNAL BRIDGE
Communications must be maintained regardless of the weather—and in the North Atlantic it can be pretty severe.

Fire-control Tower

Battleships and cruisers also have a fire-control tower, which is either a separate structure just aft of the conning tower or actually an integral part of that structure. It is the battle station of the gunnery officer and contains equipment for the control of gunfire.

Signal Bridge

The signal bridge is an open platform located near the navigating bridge and it is from this point that signalmen maintain visual communication with other ships and stations in the vicinity. Also normally located in the bridge assembly is the radio room which is usually soundproofed.

MASTS, STAFFS, AND STACKS

Masts

Navy ships have either one or two masts. If there are two, the mast placed farther forward is called the *foremast* and the other the *mainmast*. On single-masted ships the mast is well forward of amidships, is usually part of the superstructure bridge assembly, and is referred to as the foremast or simply as the mast. (Nautically the word "mast" is pronounced "mist" when coupled with another word; thus "foremast" is pronounced "foremist.")

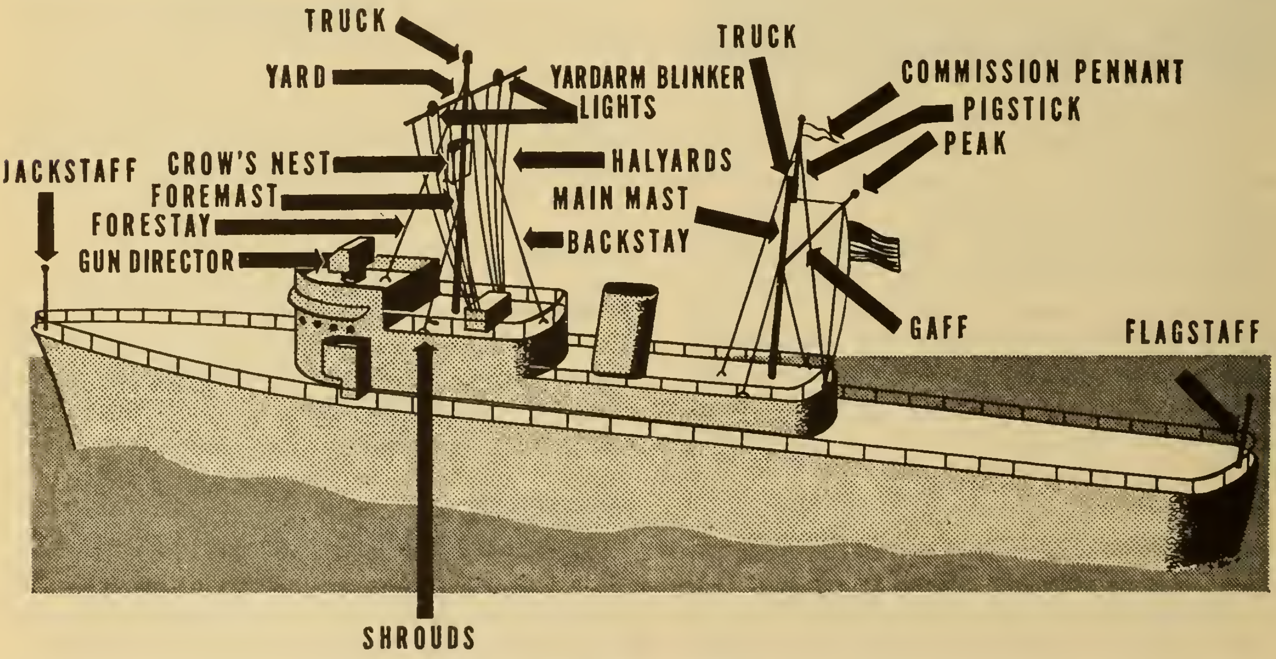
Masts may be of many sizes and shapes; some are built up of heavy structural steel and others are simply a metal or wooden pole. On larger ships a heavy mast may support an upper structure called the *foretop* or *maintop*, which houses gun directors, range finders, and other equipment for the control of gunfire. On ships of all sizes, at least one mast, together with a spar running athwartships called a *yard*, will support signaling devices rigged in such a position that they will be clearly visible from other ships. Rigidity of position of the lighter type of mast is obtained by *standing rigging* consisting of wire rope *stays* running in a fore-and-aft direction and *shrouds* running athwartships down to the bulwarks.

The mast tops of all important combatant units are fitted with a platform on which is installed one or more radar antennas. The masts also support radio antennas. Almost every naval vessel has a pigstick on the mainmast, from which either the *commission pennant* or *personal flag* of a flag officer is flown. Extending abaft the mainmast of a naval vessel is a small spar known as the *gaff*. From the top or peak of the gaff the national ensign normally is flown when the ship is underway.

Staffs and Stacks

Staff. The small vertical spars at the bow and stern of a ship are the *jackstaff* and *flagstaff* respectively. When a naval vessel is at anchor or moored, it flies the union jack on the jackstaff and the national ensign on the flagstaff from 0800 to sunset.

Stacks. The stacks on board ship are pipes em-



MASTS AND STAFFS
Every industry and profession has its own vocabulary and the Navy is no exception. Failure to use the proper term in referring to parts of a ship is unprofessional and may in an emergency lead to dangerous confusion.

ployed to expel smoke and gases from the boilers. Most naval vessels have their stacks on the centerline approximately amidships. The notable exception to this is the aircraft carrier whose stacks are located on the "island" at one side of the flight deck or protrude from the sides of the ship.

EXTERNAL COMMUNICATION AND SIGNALING EQUIPMENT*

Introduction

In the early days of the Navy, seamen relayed messages to other ships or to shore establishments by means of flags, swinging lanterns, whistles, or bells. The science of electronics has brought into use many

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*See also Chapter 22.

SIGNAL BRIDGE INSTRUCTION
Constant training brings proficiency in signaling. Smart signaling is the mark of a taut ship.

BLINKER SIGNALING
Day or night the blinker light is a means of visual communication between ships.

new types of message-sending equipment and yet, as will be seen in the discussion that follows, the old methods are still in use, with some modifications, even in the newest ships.

External Communication Equipment

External equipment for the sending of messages may be divided into the following classifications: messenger, voice, visual, sound, and radio and radar.

Messenger. Sending of information by messenger is one of the oldest methods and still remains one of the safest when secrecy is essential and speed is not. It is the best means for sending long messages which might tie up other transmission channels for an unreasonably long time. Charts and maps must be sent by messenger when it is required to transfer such matter from ship to ship or from ship to shore.

Voice. Voice communication is used only when ships are working near each other, as in fueling, or when they are engaged in mooring or docking operations or preparing to get underway. The range, obviously, is limited but may be increased by the use of amplifiers. Their use, however, augments one of the greatest disadvantages of voice communication which is its lack of security.

Visual. Visual signaling is accomplished principally by three types of devices: flaghoist, flashing light, and semaphore. These methods are used for short-range signaling although the range may be increased by relaying. Most of this type of equipment is located on or near the signal bridge.

Signal flags used in *flaghoist* signaling are bent on to halyards or light lines and hoisted to the yard. When not in use, these flags are carefully stowed in a flagbag, a device in which the flags are arranged alphabetically and numerically.

Signal *searchlights* are also located on or near the signal bridge. The searchlights have manually operated shutters and are used to transmit messages in code by alternately flashing and obscuring the light. The dot is represented by a short flash and the dash by a long flash, three times as long as that of the dot. The pause between the elements of a letter is a period of no light lasting as long as the flash representing the dot.

Yardarm *blinkers* are two electrically operated lights on the ends of the yardarm. They are controlled by a key on the signal bridge or other signal station. Blinkers, because of their high location are visible over a radius of 360 degrees and thus may give signals to several ships in formation. The searchlight, on the other hand, generally directs its light at a single ship or spot on shore.

The *semaphore* system of signaling is useful only in daytime. It was formerly used at night with a machine having movable illuminated arms, but this device was superseded by the use of flashing light. The system uses a semaphore alphabet, the characters of which are formed by changing the positions of the arms (see Appendix). The arm positions alone give the message but flags held in the hands give a greater range of visibility. Semaphore is used at sea between ships in formation. In port it is used for daytime administrative signaling between ships close enough to make this method practicable. Semaphore is quicker than flashing light and hence is used for longer messages; its range, however, is less than that of flashing light.

Other visible devices carried by ships and used to transmit specific kinds of information are speed indicators (cones, pennants, flags, and lights), flag lights, pyrotechnics, message drops, panels, and lights and shapes required by Rules of the Road. All these devices have a more limited purpose than the standard methods of visual communication, but they afford quick and easy means of transferring information.

Sound. Sound signals include the ship's bell, whistle, and siren. The ship's bell, which is usually secured to the mast above the signal bridge, is sounded when the ship is at anchor in a fog, mist, falling snow, or heavy rainstorm, either in daytime or at night. The Rules of the Road require that it be rung rapidly for about five seconds at intervals of not more than a minute. If other men-of-war are present or expected, it is customary to strike the ship's call numerals each time the bell is rung.

The ship's bell is also tolled just as divine services begin. This is preceded by church call on the bugle. At about the same time the word is passed, "The smoking lamp is out. Keep silence about the deck. Divine service is about to begin." In many ships, however, this use of the bell has been superseded by the public address system.

The whistle or siren is used in fog and whenever required by Rules of the Road and Pilot Rules when there is danger of collision due to meeting and passing, overtaking, or misunderstanding of other ship's intentions.

Underwater sound apparatus may also be classed as communication equipment but it is insecure, slow, and limited in range. In general, its use is confined to short-distance communication between submerged submarines, or for identification signals between surface vessels and submarines.

Radio. Radio is one of the most frequently used methods of sending and receiving messages at sea. Its range can be varied to suit conditions. For example, a wavelength can be selected that will be heard at a distance of 3,000 miles and yet not heard at the intervening distances. In like manner, a message sent on a wavelength that is good for communicating at short distances is unheard at greater distances.

One of the chief disadvantages of the use of radio lies in its lack of security. It is virtually impossible to conceal the point of origin and for this reason a ship may have to maintain radio silence just when she most needs that type of transmission. Moreover, interception of radio messages by the enemy is a comparatively simple matter.

SHIP'S BELL
The ship's bell is sounded when the ship is at anchor in a fog, mist, or storm, either in daytime or at night. Rules of the Road require it to be rung.

Radar. The term radar comes from the beginning letters of the phrase "radio detection and ranging." At the start of World War II, all participants had developed some type of radio locating and ranging equipment, but Britain's advances in this field were such as to enable the Royal Air Force to cope with the numerically superior Nazi aircraft. Information regarding the progress of radar was closely guarded throughout the war and it was not until the close of hostilities that any official accounts of its operation and use were disclosed to the general public.

A detailed description of the equipment is not essential to our purpose. The principle of radar is much the same as that of sound ranging except that an electrical, instead of a sound impulse is sent. The basic parts are the transmitter, directive antenna, selector switch, and receiver. With experience, a radar operator can learn much from the echo reflected on his screen.

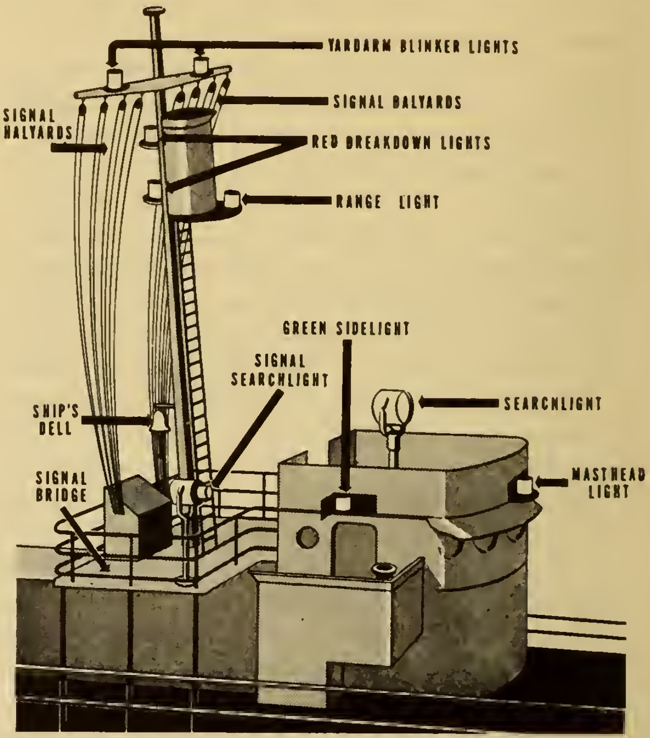
Various types of radar have been developed; for example, surface search radar, general search radar, and fire-control radar.

The peacetime possibilities of this equipment are many. It is rapidly becoming indispensable in the ground-controlled landing of commercial aircraft. It is useful to merchant ships, and the Coast Guard may be expected to employ it as standard navigational equipment for its vessels.

Lights Required by Rules of the Road

It is difficult to trace back in history to the exact time when safety of seagoing vessels required that lights be shown at night. Although it is likely that lights had been used for some time previous to 1854, in that year there was enacted the first official legislation, called the Merchant Shipping Act, that made it obligatory for waterborne traffic to show navigational lights. Later, the advent of steam increased the numbers of ships of various nations, traveling at higher speeds in the same sea lanes. International conferences were held to reconcile differences between nations and to standardize the navigational light system. The *Regulations to Prevent Collisions of Vessels at Sea*, known as Rules of the Road, were adopted by the International Convention for Safety of Life at Sea, held in Washington in 1889. These rules, the traffic code of the sea, constitute essential information for any officer of the United States Navy.

The lights required by the Rules of the Road vary with types of ships, the situations which a ship may encounter, and the operation in which she may be engaged. These lights, used in various combinations of position and color, convey a definite message to ships in the vicinity, and it is essential that an officer be thoroughly familiar with their usage before the need arises for employing them. For orientation purposes, a detailed description of the lights and their meanings is not necessary. However, a general discussion of the lights, their location, and some of the situations where they are used will give an indication of their importance in protecting ships and their personnel.



SIGNAL LIGHTS
Location, number, and color of lights aboard ship must follow the requirements set forth in the Rules of the Road, the "traffic rules" of the sea and inland waters.

High up on the mast are two red lights known as the *breakdown lights*. These are used at night when a breakdown endangers nearby ships. *Running lights* are of three types: (1) A *masthead light* is a fixed light usually located on the upper part of the bridge superstructure or on a small shelf extending forward from the foremast. The masthead light is a bright white light which is required by the Rules of the Road to be carried by all steam vessels underway. (2) The *range light* is also a bright white light. Its position is abaft and above the masthead light, and it may be either on the foremast or the mainmast. When used in conjunction with (1) above, the combination is termed the range lights. (3) A green *sidelight* is carried on the starboard side and a red on the port side.

Towing lights and *anchor lights* are also used when the situation requires them.

BOATS AND SURVIVAL EQUIPMENT

Boats

In peacetime, naval vessels carry a number of small boats. These are either suspended along the side of the ship from *davits* or are nested one inside another on deck in a position to be hoisted over the side by boat cranes. During wartime the number of wooden boats carried is drastically reduced, for they create a fire and splinter hazard in action.

Boats carried by ships are of two types—power boats and pulling boats. The power boats are motor *whaleboats* and *motorboats.* The latter are fast, decked-over boats with square sterns. They are used principally to carry officers. Motorboats assigned for the personal use of officers of flag rank are called *barges;* those assigned for the personal use of commanding officers, chiefs of staff, and so on, not of flag rank, are called *gigs.*

CRASH SURVIVORS IN A FOUR-MAN BOAT
Many an airman owes his life to the opportune use of the raft and its watertight containers of supplies.

Pulling boats are those propelled by oars. In this class are *whaleboats,* similar to motorboats except that they have no engine and are pulled with either 5 or 6 oars single banked, or 12 oars double banked. They carry air tanks for buoyancy and are generally used as lifeboats. Other types of pulling boats are *dinghies,* square-sterned, open boats pulled with 4 oars and used chiefly for recreation, training, and light work; *wherries,* square-sterned open boats that are light and can be pulled by one man; *punts,* rectangular, flat-bottomed boats that are used for painting and general cleaning around the waterline; and *cutters,* used for training purposes at training stations.

EQUIPMENT FOR SURVIVAL
The Mark 10 pneumatic life raft is a valuable item of survival gear. Work on development of survival gear continues in peacetime, and no item is accepted until it has been tested under a variety of realistic situations.

Lifesaving and Survival Equipment

The Navy uses one criterion in evaluating survival equipment: Will it save more lives without reducing the fighting efficiency of our ships?

Naval vessels are equipped with a sufficient number of lifecraft to accommodate the entire complement. The life float used by the Navy is generally a doughnut-shaped, open framework lifecraft made of balsa wood which is extremely strong and light in weight. Its releasing mechanism is hydrostatically operated but it can be released quickly by hand. Self-inflating rubber boats are also carried by naval vessels.

A number of items are included in the abandon ship equipment for lifecraft. Water and emergency food rations are of first importance. Food consists of such things as malted milk tablets, canned meat, and hardtack; water is carried in breakers or in metal cans. A fishing kit consists of hooks, lines, lures, spear, bait, and a net.

There is a signaling mirror for attracting attention during the day and a Very pistol and cartridges for signaling at night. Some lifecraft also carry additional signaling equipment such as yellow bunting, flashlight, and fluorescin dye that makes a bright yellow spot on the water visible to airplanes from long distances.

Paddles are supplied for propulsion and painters for towing. Also furnished is canvas paulin for protection against the rays of the sun. A medical kit is extremely important and includes, in addition to the usual first-aid measures, morphine syrettes and an ointment that is effective for eye irritations and sunburn.

Action reports and evidence offered by survivors of sinkings during World War II indicated that the most important piece of abandon ship equipment is the life preserver. Kapok has been found to be the most satisfactory material and the jacket type is the most commonly used style.

The fine performance of the emergency gear furnished by the United States Navy in World War II was largely responsible for saving the lives of a great majority of the men who were forced to abandon ship. No expense was spared in research, procurement, and training to provide the best available equipment. The basis of most of the experimentation in survival equipment is the personal narrative of the survivor. From his experiences the Navy learns the true value of the gear it provides for survival; from his suggestions, the Navy devises new gear and modifies existing equipment.

CHAPTER 12

STANDARD SHIP ORGANIZATION

INTRODUCTION

Basic Plan of Organization

The complement of a ship is composed of such numbers, ranks, and ratings of officers and men as are necessary to fight the ship most efficiently. A ship's organization is essentially a war organization, developed on the theory that ships should operate in peacetime with an organization that can be expanded quickly without basic change when the transition to a wartime operating condition becomes necessary. It is based on a grouping of functions and personnel that is intended to reduce to a minimum both the possible overlapping of responsibility in command and the duplication of personnel.

In general the over-all organization, under a commanding officer and an executive officer, is as follows:

1. There are three major command departments: the operations department, the gunnery (or deck) department, and the engineer department.
2. There are two staff departments: the supply department and the medical department.
3. In aircraft carriers and seaplane tenders there is an additional command department known as the air department.
4. In repair ships and tenders there is an additional department known as the repair department.

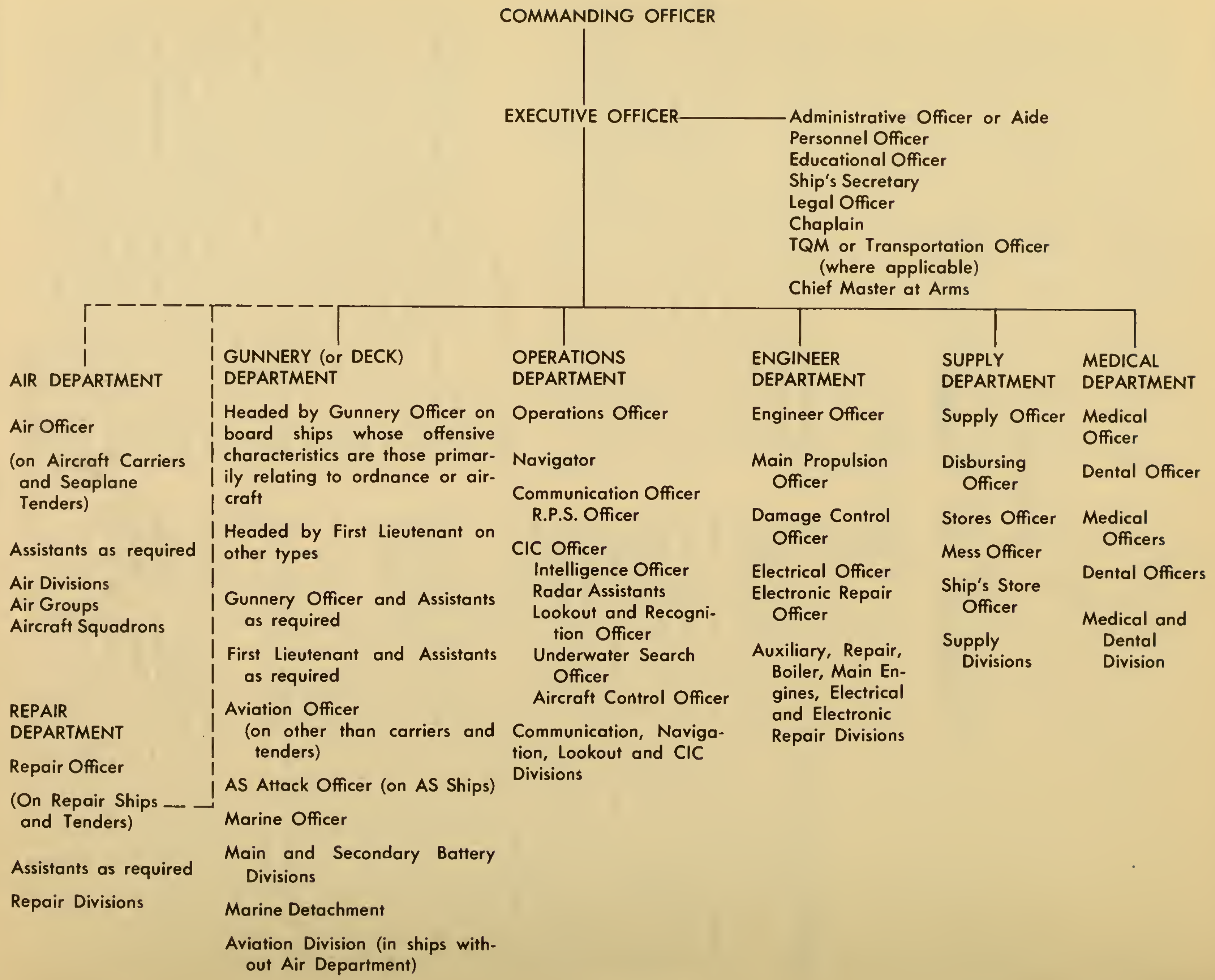
The three major command departments are headed by officers eligible to exercise command, except that an officer designated for engineering duty only (EDO) or aviation engineering duty only (AEDO) may be ordered as the engineering officer.

In aircraft carriers and when practicable in seaplane tenders, the operations and air departments are each headed by a naval aviator.

The present ship's organization (see chart on page 222) which has been incorporated in the 1948 revision of *Navy Regulations,* is based on combat requirements and the experiences of World War II. It was set forth in a publication issued in 1947 by the Chief of Naval Operations and titled *Standard Ship Organization* (OpNav 03-P103). This booklet was distributed to the fleet so that the reorganization might be in effect by the beginning of 1948.

Modifications Permitted

Standard ship organization serves as a guide for type commanders in preparing detailed administrative and battle organizations for their ships. (A type commander has command of a group of ships of a particular type; for example, Commander Destroyers, Pacific Fleet.) In preparation of the type organizations the commanders are, of course, guided by the missions and other considerations peculiar to the type and also by the quality and quantity of personnel available. Consolidation and changes within the framework of the standard ship organization are authorized. However, administrative and battle organizations prepared by corresponding type commanders in different fleets are coordinated through their respective fleet commanders, and are made identical for the same types and classes of ships. The organization described in this chapter is in general that of a large fighting ship.



COMMANDING OFFICER

EXECUTIVE OFFICER

- Administrative Officer or Aide
- Personnel Officer
- Educational Officer
- Ship's Secretary
- Legal Officer
- Chaplain
- TQM or Transportation Officer (where applicable)
- Chief Master at Arms

AIR DEPARTMENT

- Air Officer
- (on Aircraft Carriers and Seaplane Tenders)
- Assistants as required
- Air Divisions
- Air Groups
- Aircraft Squadrons

REPAIR DEPARTMENT

- Repair Officer
- (On Repair Ships and Tenders)
- Assistants as required
- Repair Divisions

GUNNERY (or DECK) DEPARTMENT

- Headed by Gunnery Officer on board ships whose offensive characteristics are those primarily relating to ordnance or aircraft
- Headed by First Lieutenant on other types
- Gunnery Officer and Assistants as required
- First Lieutenant and Assistants as required
- Aviation Officer (on other than carriers and tenders)
- AS Attack Officer (on AS Ships)
- Marine Officer
- Main and Secondary Battery Divisions
- Marine Detachment
- Aviation Division (in ships without Air Department)

OPERATIONS DEPARTMENT

- Operations Officer
- Navigator
- Communication Officer
  - R.P.S. Officer
- CIC Officer
  - Intelligence Officer
  - Radar Assistants
  - Lookout and Recognition Officer
  - Underwater Search Officer
  - Aircraft Control Officer
- Communication, Navigation, Lookout and CIC Divisions

ENGINEER DEPARTMENT

- Engineer Officer
- Main Propulsion Officer
- Damage Control Officer
- Electrical Officer
- Electronic Repair Officer
- Auxiliary, Repair, Boiler, Main Engines, Electrical and Electronic Repair Divisions

SUPPLY DEPARTMENT

- Supply Officer
- Disbursing Officer
- Stores Officer
- Mess Officer
- Ship's Store Officer
- Supply Divisions

MEDICAL DEPARTMENT

- Medical Officer
- Dental Officer
- Medical Officers
- Dental Officers
- Medical and Dental Division

COMMANDING OFFICER

General Responsibilities

The duties, responsibilities, prerogatives, and authority of the commanding officer of a ship are well established by regulations, orders, and customs. The new ship's organization does not change the status of the commanding officer.

The standard ship organization vests in the commanding officer the responsibility for the performance of his command. *Navy Regulations* places many specific responsibilities directly in his hands and makes him solely responsible for his acts in carrying them out. In the discharge of his duties he is assisted by the executive officer who acts as his direct representative.

Specific Duties

The supervision of the conduct of all persons under his command is the commanding officer's responsibility and, should he not suppress unlawful activities or conduct, he is subject to punishment by court-martial. In the investigation of offenses and the assignment of punishment he cannot delegate his authority. He is required to have the Articles for the Government of the Navy, which contain the provisions of law governing the disciplinary system in the Navy, published monthly to the crew.

The welfare and living conditions of the crew are the constant concern of the commanding officer. The medical officer assists him in maintaining the ship in sanitary condition, and provides for proper care and isolation in the case of infectious diseases. Provisions must be maintained and stored in proper condition, and precautions taken for their preservation.

The maintaining of the material readiness of the ship for war service is a duty of the commanding officer. He issues the necessary directions to his executive officer who in turn, with the assistance of the various heads of departments, prepares and conducts the exercises and drills required to bring about proficiency. He is also responsible for guarding the security of material against compromise or sabotage.

A primary responsibility of the commanding officer at all times is the safety of the ship. This means specific orders regarding the handling, stowage, and use of ammunition; provisions for watertight integrity involving closing watertight doors, opening ports at sea, and other relevant matters; careful navigation, and so on. While the navigator is charged with all the specific duties of ascertaining the position of the ship at all times, the commanding officer has the full responsibility in all matters of navigation. Other matters that pertain to the safety of the ship are the posting of proper lookouts, showing of required lights, observance of Rules of the Road to prevent collisions, and taking of soundings to check with the plotted position of the ship. While it is impossible for the captain to attend to these matters personally, if these precautions are not observed. and the ship comes to grief as a result, the blame nevertheless falls primarily on the commanding officer.

The training and education of the ship's company are vitally important in the attainment of fighting efficiency. The instruction of officers and men is a responsibility of the commanding officer which he delegates to the executive officer. The conviction of the Navy's outstanding educator of the last century, Admiral Stephen B. Luce, that the Navy should be an educational institution for all hands, has been steadily materializing for many years. Almost all ships now have an organized program of shipboard training.

In the presence of the enemy or when approaching a strange ship, general quarters is sounded and the ship is made ready for battle. The commanding officer's battle station is that station from which he can fight the ship to the best advantage. In case of loss of ship, both custom and regulations require that the captain be the last to leave.

If the officer regularly ordered to command a ship is absent, disabled, relieved from duty, or detached without relief, the command devolves upon the line officer next in rank regularly attached to and on board the ship (exclusive of such officers as may be restricted to the performance of engineering duties only).

The commanding officer's position is quasijudicial. In fact, it is legislative, judicial, and executive. It is an awful and a complete power, and has been from time immemorial. It is obvious why this must be so. Such great responsibility requires commensurate power. Hence, it is essential to efficiency and discipline that a commanding officer should have the power to enforce prompt obedience to his orders. By Article 24 of the Articles for the Government of the Navy, the power is vested in the commanding officer to impose limited punishment. This power is an attribute of command and may not be delegated to a subordinate. Further discussion of the commanding officer's responsibility in matters of discipline and naval tribunals appears in Chapter 5. (See also the Appendix, for the Articles for the Government of the Navy.)

THE EXECUTIVE OFFICER

General Status

The chief assistant to the commanding officer is the executive officer who is detailed as such by the Secretary of the Navy, from officers of the line, exclusive of those restricted by law to the performance of engineering duties. He is the next ranking officer aboard ship and the direct representative of the commanding officer in maintaining the military and general efficiency of the ship. The executive officer has no authority independent of the commanding officer, and the

THE CHAPLAIN IS THE SPIRITUAL AND MORAL COUNSELLOR
In the ship's organization, the chaplain is an assistant to the executive officer.

details of his duties are regarded as execution of the captain's orders. In order that he may properly perform the duties imposed upon him, all heads of departments and other officers and enlisted men are under his orders in all matters pertaining to the operation and maintenance of the ship and to the preservation of order and discipline on board.

Duties and Responsibilities

Responsibility for the personnel and for the ship's routine, efficiency, and discipline lies mainly with the executive officer. Specifically the new ship's organization lists the following administrative functions which apply to the ship as a whole:

1. Coordination and supervision of all departments
2. Morale, welfare, and discipline
3. Assignment and records of personnel
4. Religious matters
5. Preparation and maintenance of bills and orders
6. Supervision and coordination of work, exercises, and training
7. Supervision of loading and berthing plans
8. Supervision of ship's correspondence
9. Training and education of the ship's company
10. Legal matters

POST OFFICE AFLOAT
The importance of mail as a factor in morale has long been recognized by the United States Navy. Outgoing mail is being sorted in this scene in the mail room of USS *Wisconsin*.

The executive officer is required to be familiar with every part of the ship. With the assistance of the heads of departments he arranges and coordinates all ship's work, drills and exercises, personnel organization, policing of the ship, and inspections of the ship. He is charged with the maintenance of cleanliness, good order, efficiency, and the neat and trim appearance of the ship and the crew. When on board ship, the executive officer is always on duty.

The executive officer keeps in close touch with all the activities of the ship and supervises the heads of departments in the performance of their duties, including the instruction of junior officers. In small ships, he may perform the duties of navigator.

The executive officer supervises the entries in the crew's Service Records and is responsible for their accuracy. All matters of discipline and conduct of the crew are investigated by him and reported to the commanding officer. The executive officer approves the liberty and leave lists for the crew.

He relieves the deck whenever all hands are called for any particular duty, exercise, or evolution, except at quarters and during action. He is not required to stand a watch but he may relieve the officer of the deck for short periods as a matter of accommodation.

If for any reason the executive officer is rendered incapable of performing the duties of his office, they devolve upon the line officer next in rank below him, attached to and on board the ship (exclusive of such as are restricted to engineering duty and Naval Reserve officers not qualified for the performance of all deck duties afloat).

When the ship is cleared for action, the executive officer inspects it, receives reports from the various departments, and in turn reports to the commanding officer that the ship is, in all respects, ready. In case the captain is incapacitated, the executive officer is the relief commanding officer. For this reason his battle station, determined by the commanding officer, is if practicable in a location where he will escape the effects of a casualty disabling the captain. It is usually in the secondary ship control station, and from there he maintains communication with the primary control station. After battle, the executive officer makes a detailed report to the commanding officer, citing all details of the action observed, together with a statement of the conduct of subordinates in praise or censure as the case may be.

Assistants

The accompanying chart of the standard ship organization shows the personnel that may be assigned under the executive officer to assist him in the performance of his many, varied duties.

Administrative Officer or Aide. The administrative officer or aide is charged primarily with relieving the executive officer of administrative details; he also performs such additional duties as may be assigned him. His battle station is as assigned. The billets of administrative officer or aide and personnel officer may be combined.

Personnel Officer. The personnel officer is charged with assisting the executive officer in the assignment of personnel to the various departments, their berthing, maintaining of accurate personnel records as required by regulations and orders, and the operation and maintenance of material used in connection therewith. Additional duties and battle station are as may be assigned.

Educational Officer. The educational officer is charged with the receipt, maintenance, and distribution of educational courses and training aids, and with the operation and maintenance of material used in connection with these duties. Additional duties and battle station are as assigned.

Ship's Secretary. The ship's secretary is responsible for the care and routing of all ship's correspondence, classified or otherwise; he may be the custodian of the ship's registered publication library or at least assist the communication officer in maintaining it; also, he is normally the custodian of all other classified matter issued to the ship. He supervises and trains enlisted personnel of the captain's office, the post office, and the print shop. Usually he stands watches as a communication watch officer, or crypto-board member.

Chaplain. The chaplain is charged specifically with those religious matters as outlined in regulations and orders. While his duties are primarily religious, the chaplain is often assigned additional duties that tend to promote the mental, moral, and physical welfare of the personnel aboard.

PRINT SHOP ABOARD USS *YORKTOWN*
The ship's secretary supervises and trains personnel of the ship's print shop. Most ships put out some form of newspaper as well as other forms of printed matter.

Since the earliest days of the United States Navy, chaplains have been attached to our ships. Generally they are assigned to battleships, aircraft carriers, heavy and light cruisers, transports, hospital ships, and auxiliary vessels that serve destroyers, seaplanes, and submarines.

Chaplains conduct divine services each Sunday, weather and other circumstances permitting; they officiate at baptisms, marriages, and funerals; visit the sick and imprisoned; provide religious instruction; and counsel with personnel in matters pertaining to their spiritual life.

In addition to his religious duties, the chaplain may supervise the ship's library and the ship's paper. During battle, chaplains are usually assigned to duty at a dressing station with the medical officer, or given a roving assignment. Commanding officers frequently call on the chaplain to give an account of the battle over the loudspeaker system, and in many ships of the fleet a prayer before battle is read by the chaplain over the public address system.

Throughout the long years of World War II, Navy chaplains were in the thick of the fight. When the Second Marine Division invaded the Gilbert Islands in 1943, ten chaplains went ashore with the troops.

A total of 13 chaplains were killed in battle and 30 were wounded before the war ended.

As liaison between the military and the home front, the chaplain is frequently called upon to cooperate with social and welfare organizations, administer Navy Relief, and correspond with relatives and friends of naval personnel in matters that involve dependents, deaths, illnesses, and domestic problems.

It is a tradition of the Service that the chaplain shall be the spiritual and moral counselor of his ship, and as such he is always available when officers or men wish to seek his advice on problems that vary from affairs of the heart to requests for a loan from Navy Relief.

In the early days of our Navy the chaplains, who were not always ordained, not only held divine services, but also acted as schoolmasters with the special assignment of teaching navigation to young officers and midshipmen. Today they assist in the educational, athletic, and recreational programs.

The following additional assistants may also be assigned to the executive officer: a transport quartermaster, a transportation officer, a legal officer, and a chief master-at-arms.

HEADS OF DEPARTMENTS

Status

The head of a department is so detailed by competent authority. He is the representative of the commanding officer in all matters pertaining to the department. All persons assigned to the department are subordinate to him and subject to his orders. In performing his duties he is required to conform to the captain's policies and to comply with his orders.

Responsibilities and Duties

Whenever necessary the department head confers with the commanding officer in matters concerning his department. The condition of machinery and other equipment and the need for major repairs are reported to the captain by him. He also keeps the executive officer informed of such matters.

The department head's duties and responsibilities cover a broad area. He assigns personnel to stations and duties within the department, and to further the effectiveness of his department he supervises their work and training. He is responsible for their observance of security measures and safety precautions.

The proper operation, care, preservation, and maintenance of department equipment are his responsibility as also are cleanliness and upkeep of spaces assigned. He frequently inspects both personnel and equipment and takes action to correct any factors that may interfere with the department's effectiveness.

He prepares bills and orders for the organization and operation of the department. Control of the funds allotted is in his hands and he is expected to be economical in their use. Further, he must anticipate personnel and material needs and submit timely requests to fulfill requirements. Certain records must be kept and reports submitted by every department in order to insure an efficient over-all organization. It is the department head's duty to see that these matters are not neglected. He is also expected to cooperate with other heads in order that the work of his department may be smoothly coordinated with that of other departments wherever possible.

In small commands, an officer may be assigned as head of more than one department.

Heads of departments and their principal assistants are assigned battle stations where they can best supervise and control the performance of duties regularly prescribed for them, or such specific battle duties as the commanding officer may assign.

OPERATIONS DEPARTMENT

Organization

Under the operations officer as department head, the operations department consists of the communication, navigation, and CIC and lookout divisions. Reference to the chart will show that the functions assigned to this department cover a broad area.

Operations Officer

The operations officer is responsible, under the commanding officer, for all the usual duties of a department head and specifically for the collection, evaluation, and dissemination of combat and operational information required for the assigned missions and tasks of the ship; and, except those that are assigned to another officer, for all other matters related to the operations of the ship and designated airborne aircraft. The functions of the operations department, for which the operations officer is responsible, include the conduct of visual and electronic exterior communications and search and the execution of electronic countermeasures. Control of registered publications and collection and analysis of intelligence information are handled by the operations department. It is readily seen that the operations officer occupies a key spot in the ship's activity.

The normal battle station of the operations officer is in the combat information center as evaluator. The commanding officer may station the operations officer elsewhere in order that he may best perform those battle duties assigned him.

He may be assisted in his work by a communication officer and a combat information center officer.

Navigator

The navigator is directly responsible to the commanding officer for the safe navigation and piloting of the ship. He makes reports in connection with his navigating duties directly to both the commanding officer and the operations officer. In other matters within the operations department, he is directly responsible to the operations officer.

Specifically, the duties of the navigator include the following:

He advises the commanding officer and the officer of the deck as to the ship's movements and, if the ship is running into danger, as to a safe course to be steered. In order to carry out effectively this phase of his responsibilities, he must maintain an accurate plot of the ship's position by astronomical, visual, electronic, or other appropriate means; study all available sources of information, prior to entering pilot waters, regarding navigation of the ship in such waters; give careful attention to the course of the ship and the depth of water when approaching land or shoals; maintain record books of all observations and computations made for the purpose of navigating the ship, with results and dates involved; report in writing to the commanding officer, when underway, the ship's position at stated intervals, and at such other

A COURSE IS PLOTTED IN THE CHART ROOM
The navigator must maintain an accurate plot of the ship's position.

times as the commanding officer may request; and procure and keep corrected and up to date all hydrographic and navigational charts, sailing directions, light lists, and other publications and devices for navigation as may be required.

He has responsibility for the operation, care, and maintenance of the navigational equipment. To this end he is required to determine daily, when the ship is underway and weather conditions permit, the error of the gyro and standard compasses, and report the result in writing to the commanding officer. He also compensates the magnetic compasses and prepares tables of deviations, copies of which are posted at the appropriate compass stations. Accuracy of ship's chronometers and clocks is his responsibility also and he is required to insure that electronic navigational equipment used by him is kept in proper adjustment, and that calibration curves or tables are maintained and checked at prescribed intervals.

The navigator is responsible for the care and proper operation of the steering gear in general (except the steering engine and steering motors).

Daily, and oftener if necessary, the navigator inspects the deck log and the quartermaster's notebook. He is required to take corrective action if necessary to insure that they are properly kept. He also prepares such reports and records as are necessary in connection with his navigational duties, including those pertaining to the compasses, hydrography, oceanography, and meteorology.

He relieves the officer of the deck as authorized or directed by the commanding officer.

The Communication Officer

The communication officer of a ship is responsible, under the operations officer, for visual and electronic exterior communications and for the administration of related internal systems. Operation, care, and maintenance of visual and electronic exterior communication equipment are his concern as are the procurement, custody, distribution, physical security, correction, and reporting of all classified registered publications and devices issued to the ship and of all other classified matter assigned to him.

The communication officer acts as head of the coding board and as such is responsible for the supervision and training of that board in the employment of the codes and ciphers issued to the ship, in the principles of cryptography, and in communications security.

NAVIGATOR AND QUARTERMASTER USING THE SEXTANT
The navigator is responsible to the commanding officer for the safe navigation and piloting of the ship.

The commanding officer may assign assistants to the communication officer to act as signal officer, radio officer, and officer in charge of registered publications.

Signal Officer. The signal officer is responsible for the operation and maintenance of the ship's visual signaling apparatus and the communication apparatus used in connection with it. He is in charge of all personnel of the signal force, supervises their training and watchstanding, and takes direct charge of them during maneuvers, tactical drills, general quarters, getting underway, and coming to anchor. He must be reasonably proficient in all methods of visual signaling, and thoroughly familiar with the *General Signal Book* and current tactical publications. When the ship is underway, the signal officer normally spends most of the daylight hours on the bridge; his battle station usually is the signal bridge or navigation bridge.

Radio Officer. The radio officer is responsible for the operation of the ship's radio and underwater sound apparatus and the communication equipment used in connection with it. He is directly in charge of the communication watch officers and conducts their training and supervises their watchstanding. He is held responsible by the communication officer for the proper internal delivery of incoming dispatches, and for the proper routing and delivery of outgoing dispatches. He is in immediate charge of all radio enlisted personnel and is responsible for their organization, training, and watches. He must be familiar with the contents of pertinent communications publications; he should be a reasonably proficient operator and he should also have at least a good basic knowledge of radio material. He is the normal relief for the communication officer, in whose duties he should be as completely qualified as possible. The radio officer's battle station is normally in Radio I where he can directly supervise radio communications.

Officer in Charge of Registered Publications. Registered publications are classified publications to which for security reasons register numbers are assigned and for which periodic accounting of custody, receipt, transfer, and ultimate disposition are required. It is the duty of the registered publications officer to care for such matters.

Combat Information Center Officer

Under the operations officer, the combat information center officer is, in general, responsible for the operation and maintenance of the combat information center and related spaces.

Specifically, he is responsible for the collection and dissemination of combat and operational information. The operation, care, and maintenance of equipment,

NERVE CENTER OF THE SHIP
Communication office where, among the maze of cable, typewriters, and sending and receiving gear, contact is maintained with other ships, with bases, and with all parts of the ship.

including radar and underwater search gear, used in procuring and evaluating combat and operational information are in his hands.

Recognition training, the supervision and training of visual lookouts and of operators of radio countermeasures and underwater search equipment are among his assignments. He is also responsible for control of airborne aircraft not otherwise assigned.

He may be assisted by an aircraft control officer, a lookout and recognition officer, and an underwater search officer; other assistants may be an intelligence officer and a radar officer.

Intelligence Officer. The responsibility of obtaining intelligence and keeping it current and usable within a command is delegated to the intelligence officer. His job is to provide the commanding officer with strategic and operational intelligence required for the execution of that officer's mission; to effect the security measures necessary to assure that information of our own forces does not reach the enemy; to combat sabotage and subversion in our own forces; and to furnish the Office of Naval Intelligence all intelligence of value to the Navy. (As used here, the term *intelligence* means information of the enemy, processed expertly in order to insure its accuracy and significance with respect to the mission of our own forces.)

With these aims in mind the intelligence officer collects information of the enemy from all available sources, such as reconnaissance (visual or photographic), captured enemy documents, intercepted enemy communication, and reports collected from prisoners of war or obtained by friendly intelligence agencies. The task of the intelligence officer is to make himself an expert on the enemy, in order to assist his commanding officer. Thus his duties involve the tabulation of enemy order-of-battle data, the procurement of charts and maps essential to an accurate knowledge of the theater of operations, and such weather, hydrographic, topographic, and other data as may be needed. Normally, he is required to maintain situation plots showing the location, identity, and strength of enemy forces; an intelligence journal which provides a chronological record of intelligence reports received and disseminated; and general intelligence files which include intelligence reports and publications produced by ONI, theater intelligence centers, and other similar agencies on lower echelons. He also prepares the intelligence section of action reports. He is responsible for maintaining files of all recognition manuals and material prepared by ONI.

WARTIME RADAR PLOT ROOM ON A DESTROYER
American and Australian officers make computations in the plot room, prior to the shelling of Brunei Bay late in World War II.

Lookout and Recognition Officer. It is always vitally important that men in key positions aboard ship (such as gunner's mates, fire controlmen, and men on the bridge) be able to spot planes and ships as friend or enemy. Recognition officers are assigned to all larger ships such as battleships, cruisers, aircraft carriers, destroyers, auxiliary craft, and destroyer escorts. They are charged with instructing ship's personnel in aircraft and surface craft recognition. They may be called upon to aid in spotting and identifying planes and ships and may assist in training lookouts.

Aircraft Control Officer. The aircraft control officer functions in operations connected with the taking off and landing of planes on the ship's deck.

Underwater Search Officer. An underwater search officer is assigned to the combat information center in ships equipped with sonar gear.

Radar Officer. The radar officer's duties are in connection with the receipt and transmission to proper personnel of all data available to the ship through the medium of radar.

GUNNERY (OR DECK) DEPARTMENT

Introduction

Ships whose offensive characteristics are those primarily relating to ordnance or aircraft have a gunnery department headed by the gunnery officer whose responsibilities also embrace those pertaining to deck seamanship; the gunnery officer in such case is assisted by the first lieutenant. Other ships have a deck department whose head is the first lieutenant; in such case the gunnery officer is his assistant.

In small ships, the duties of the gunnery officer and first lieutenant may be combined.

Organized aviation units regularly attached to and embarked in a ship not having an air department are assigned to the gunnery department and comprise the aviation division; such units retain their basic organization even when so assigned. A Marine detachment when embarked is assigned to the gunnery or deck department. Other divisions of the gunnery (or deck) department are the main and secondary battery divisions.

Gunnery Officer

In general, the gunnery officer is charged primarily, under the commanding officer, with supervision and direction of the employment of the ordnance equipment and the equipment associated with deck seamanship.

Like all department heads, he is charged by *Navy Regulations* with a variety of duties peculiar to his department, in addition to those regularly assigned to department heads. Some of his most important tasks, as might be expected, are in connection with safety precautions necessary in the handling and stowage of ammunition. He must insure that safety orders are posted in conspicuous places and that personnel adhere strictly to them. Thorough instruction and frequent drills in pertinent safety measures are required of him. Inspections and tests of ammunition and ammunition spaces as prescribed by the Chief of the Bureau of Ordnance are his responsibility as are the procurement, care, handling, stowage, accounting for, and use of explosives.

In ships that do not have an air department, operations such as launching and recovery, connected with assigned planes are functions of the gunnery or deck departments and are delegated to the aviation officer.

Operation, care, and maintenance of armament, of electronic equipment, of mine warfare equipment, and of antisubmarine equipment when not otherwise assigned are functions of the gunnery department. Deck seamanship, loading, and unloading operations, and any care or maintenance in connection with such operations are within the province of the gunnery officer. He has charge of operation and upkeep of the ship's boats, except the engine and engine compartment which are the responsibility of the engineer officer.

His battle station is as control officer of the ship's batteries or as directed by the commanding officer.

He may have as assistants, in addition to the first lieutenant, the following: a main battery officer, fire control officer, air defense officer, torpedo officer, mine warfare officer, aviation officer, Marine officer, antisubmarine officer, and CIC liaison officer. The ship's function and operating condition determine the type and number of assistants assigned to the gunnery officer.

First Lieutenant

As previously stated, the first lieutenant is the head of the deck department on ships not primarily concerned with offense through ordnance or aircraft. He is charged basically with the supervising and directing of the employment of equipment associated with deck seamanship and of ordnance equipment. Like all department heads he is responsible for the training, direction, and coordination of personnel assigned to his department, for the maintenance and submission of reports required, and for the care and upkeep of allotted spaces.

The remainder of his duties are similar to those described in the preceding section as belonging to the gunnery officer, except that his main responsibilities are those concerned with deck seamanship, while those related to ordnance are of secondary importance, and are delegated to his assistant, the gunnery officer, if assigned.

Other assistants may include a cargo officer and boatswain. He may also have the assistants listed as assigned to the gunnery officer in the previous section.

The battle station of the first lieutenant is where he may best supervise the performance of deck functions; his assistant, the gunnery officer, acts as control officer of the ship's batteries.

Marine Officer

The commanding officer of the ship's Marine detachment, although not a head of department, occupies a somewhat similar position with respect to the internal administration and security responsibilities of the Marines aboard. In a dual role, he is also one of the division officers of the gunnery department, inasmuch as the Marine detachment is a regular part of the ship's company.

The Marine detachment commander is responsible to the ship's captain for the efficiency of his detachment and for the phases of ship's internal administration that are applicable to the detachment. He is required to conform to administrative instructions promulgated by the Commandant of the Marine Corps relative to preparation and submission of pay rolls and muster rolls, promotions, accounting for Marine Corps property, and similar details. Essential training that is not conducted under the supervision of a department head is a charge of the Marine officer.

He is responsible to the department head for training conducted under his supervision, and for the care, preservation, and operation of such equipment, supplies, and spaces as are assigned to the Marine detachment by the department head.

The Marine officer must be present when Marines appear at mast but does not, of course, possess the authority to award punishments.

All permanent or standing orders for sentries are approved by the captain and pass through the Marine detachment commander. When necessary, the officer of the deck may give special orders to sentries. Such orders are communicated to the sentries by the sergeant or corporal of the guard.

Daily inspections of the Marines and their quarters are the responsibility of the Marine officer. He conducts such drills as may be required and may be detailed to superintend the small arms practice and landing force training of the ship's company. He renders such intelligence reports as may be required by the commanding officer.

Marine Detachments Afloat. Marine detachments aboard larger ships form a separate division. In wartime, Marine detachments of varying size serve on many types of ships—battleships, carriers, heavy and light cruisers, and troop transports. Each Marine must volunteer, work, and train for the privilege of becoming a seagoing Marine.

Marines serve as orderlies for the ship's commanding officer or for other high-ranking naval officers aboard, and they also act as security guards at sea or in port. Marines may be detailed to other duties afloat, including but not limited to communications, staff, liaison, guard, and aviation duty when so ordered by competent authority. Except as otherwise prescribed by law or regulation, the authority and responsibility of Marines so detailed are the same as for naval personnel serving in similar positions.

MARINE OFFICER OF THE DECK
A snappy salute is rendered as a visitor comes aboard. Unless prevented by urgent duty, the officer of the deck is expected to be at the gangway to receive all officers or distinguished visitors.

According to *Navy Regulations* the functions of a Marine detachment detailed for duty aboard a Navy ship are as follows:

1. To provide a unit organized, trained, and equipped for operations ashore, as part of the ship's landing force, as part of a landing force of Marines from ships of a fleet or subdivision, or as an independent force for limited operations.
2. To provide gun crews.
3. To provide internal security for the ship.

In battle, the Marine detachment mans gunnery stations, normally in the antiaircraft battery; at this time, the senior Marine officer and his detachment officers ordinarily perform various gunnery control duties. As far as practicable, the detachment is employed as an intact division in the organization of the ship for battle.

All Marines, except orderlies, turn out with the bluejackets to handle ammunition when it is brought aboard, generally assist in provisioning the ship, and square away their own compartment. In port, Marine sentries guard the gangways. If the ship captures an enemy vessel, they join the boarding party and prize crew.

Marine officers may act as officer of the deck or junior officer of the deck in port according to their qualifications. Underway, the junior officers may act as junior officers of the deck, and specially qualified Marine officers may, although infrequently, act as officer of the deck.

ENGINEER DEPARTMENT

Introduction

The important functions of operation and maintenance of ship's machinery are assigned to the engineer department. Damage control and certain types of repair are also in the charge of the various divisions that may comprise this department. Such divisions may be the auxiliary, repair, boiler, main engines, electrical, and electronic repair.

Engineer Officer

The head of the engineer department is designated the engineer officer. He performs the duties regularly assigned to a department head; and in addition is responsible under the captain for the operation, care, and maintenance of all propulsion and auxiliary machinery, for the control of damage, and upon request from the head of the department concerned for the accomplishment of any repairs that are beyond the capacity of the repair personnel or equipment of other departments.

Specifically, *Navy Regulations* charges him with the operation, care, and maintenance of all machinery, piping systems, and electric and electronic devices not otherwise assigned. Hull and machinery repair are within his province as are the furnishing of power, light, ventilation, heat, refrigeration, compressed air, and water. Maintenance of underwater fittings is assigned to the engineer department. Any fuels and lubricants not assigned to other departments for care, stowage, and use are the responsibility of this department. The engineering log and the engineer's bell book are also kept here.

Various assistants may be assigned to help the engineer officer carry on the functions of his department. These may include the main propulsion assistant, the damage control officer, the electrical officer, and the electronic repair officer.

In battle, the engineer officer is usually stationed in main control.

Assistants

Main Propulsion Assistant. The main propulsion assistant, when assigned, is responsible under the engineer officer for the operation, care, and maintenance of the ship's propulsion machinery, its auxiliaries, and any other auxiliaries assigned.

By *Navy Regulations* this officer must insure the effective operation of the main engines and boilers and assigned auxiliaries. Frequent examinations must be made both of machinery and of equipment, and repairs and adjustments must be effected, subject to required authorization. Supervision and operation of the main engines are his responsibility when getting underway or at other times when unusual care is required. He must insure that boiler fires are not

CHECKING THERMOMETER READINGS
A machinist's mate on Reserve cruise checks the thermometer readings in the engine room of the destroyer *English*.

lighted or secured without permission from the captain, except in cases of emergency. He must insure that main engines are not turned except in obedience to a signal from or by permission of the officer of the deck.

His responsibilities also extend to the care, stowage, and use of bunker fuels, except those for aircraft, and to the operation, maintenance, and security of the related systems.

To him the engineer officer delegates the duties connected with keeping the engineering log and the engineer's bell book and those pertaining to various other engineering records.

The main propulsion assistant's battle station is normally at the secondary main propulsion control station.

He may be assigned officer and other assistants.

Damage Control Assistant. When a damage control assistant is assigned, he is responsible, under the engineer officer, for establishing and maintaining an effective damage control organization, and for supervising repairs to the hull and machinery, except when they are otherwise assigned.

His responsibilities in the prevention and control of damage include control of stability, list, and trim. He is required to supervise placing the ship in the condition of closure ordered by the captain and must insure that appropriate closure classifications are assigned and conspicuously marked upon or adjacent to the objects to which they apply. He coordinates and supervises the carrying out of prescribed tests of compartments and spaces for tightness. He prepares and maintains bills for the control of damage and stability and insures that correct compartment check-off lists are posted. Further, the training of ship's personnel in damage control is assigned to him; this includes instruction in emergency repairs and nonmedical defensive measures against gas and similar weapons.

The operation, care, and maintenance of auxiliary machinery, piping, and drainage systems not otherwise assigned are in his charge. Similarly, he is responsible for the ship repair facilities and the repair of hull and boats.

He may be assigned officer assistants to aid him in the performance of his duties.

The damage control assistant's battle station is usually at the main damage control station.

Electrical Officer. Under the engineer officer there may be assigned an electrical officer charged primarily with the operation, maintenance, and repair of electrical machinery and the equipage connected with it. This also includes the interior communications system electrical gear. Training and supervision of assigned personnel are in his charge as also is the preparation of any records or reports required in connection with his work. His battle station is normally as officer in charge of electrical repair.

Electronic Repair Officer. The electronic repair officer is charged primarily with the repair of all electronic equipment beyond the repair capacity of the department to which it is assigned. He also has responsibility for the operation and maintenance of any equipment used in electronic repair. His functions extend to the training and supervision of assigned personnel, the preparation of any records and reports connected with his work, and the upkeep of assigned spaces.

In battle he is stationed where he may best supervise repairs to electronic installations of the ship.

SUPPLY DEPARTMENT

Introduction

The three previous sections discussed the command departments — operations, gunnery (or deck), and engineering; in this section we discuss the supply department which, with the medical department, comprises the staff departments.

The supply department exists for the purpose of insuring orderly procedures in connection with matters such as procurement, receipt, stowage, issue, and accounting for equipment, repair parts, and consumable supplies required to support the ship's assigned employment.

The number and functions of the divisions of the supply department will, of course, vary from ship to ship, but supply responsibilities normally are divided according to the following areas: disbursing, stores, mess, and ship's store.

Supply Officer

The supply officer is the head of the supply department. As such. he is senior to any Supply Corps officer who may be serving aboard.

In addition to the regular duties of a department head, *Navy Regulations* charges him under the commanding officer with general responsibility for fulfillment of the purpose and functions of the supply de-

SUPPLYING A BATTLESHIP
The heart of the supply system aboard ship—the office of the supply officer and his staff.

partment. These include receiving, delivering, and shipping of authorized baggage and medical and dental supplies and equipment. Required inspection of material received under orders and contracts is his responsibility. He may be assisted by qualified technical inspectors if the material delivered is of a nature requiring their presence.

His department is charged with proper operation of the general mess, including preparation and service of food. Responsibility is assigned him for all commissary records and returns, storeroom spaces, issue rooms, and the supervision of all commissary personnel. He is required to insure the good condition of the galley and bakery. (At certain shore activities, such duties are assigned to the commissary department.) Also in the charge of the supply officer is the ship's store which furnishes articles and services for the well-being and contentment of the ship's crew. (Ship's service stores are no longer operated afloat, but there are such stores ashore, within naval districts, under supervision of the Navy Ship's Store Office and they are in the charge of Supply Corps officers.) This officer is responsible for the operation of the clothing and small stores unit which furnishes standard naval uniform items and small stores to the ship's crew.

Disbursing of government funds is a duty of the supply officer, but when there is an assistant for disbursing assigned to the command, the supply officer is relieved by him from responsibility for procurement, custody, transfer, issue of, and accounting for funds. In such case the supply officer exercises general supervision over and inspects the accounts of the assistant for disbursing.

His accounting duties cover a broad area, extending to allotment, cost, appropriation, and property accounting, and preparation of civil pay rolls. He must also maintain stock records, posted to date, for all stores for which he is held responsible. These records are maintained to establish accountability for stores and to provide stock control information that will facilitate replenishment and enable proper and adequate stocks of material to be maintained.

Such officers as may be required are assigned as assistants to the supply officer. These assistants may include an assistant for disbursing, a stores officer, a ship's store officer, and a mess officer. A mess deck master-at-arms, when assigned, assists the supply officer in such matters as the maintenance of good order and discipline connected with the general mess, the cleanliness of the messing compartments, and the care and upkeep of the messing equipment.

In battle, the supply officer and his assistants may be assigned to various duties as: assistant in fire control, battery officer, antiaircraft control, and member of the coding board.

Assistant for Disbursing. In ships to which two or more commissioned officers of the Supply Corps are permanently attached, disbursing duty is performed by the junior, or one of the junior officers who is designated as the assistant for disbursing. The supply officer exercises general administrative control over the disbursing activity but is not accountable for any funds handled by the disbursing officer. This latter officer is responsible for the procurement, custody, transfer, and issue of funds, and is accountable therefor to the United States. He is responsible for maintaining pay records and for paying the ship's crew, and for making disbursements in connection with the general operation of the ship.

MEDICAL AND DENTAL DEPARTMENTS

Introduction

The medical department is established aboard combatant ships in order not to impose administrative requirements that might interfere with the proper functioning of their battle organization. In hospital and other large noncombatant ships the establishment of a separate dental department by the commanding officer is authorized. In certain other types of ships there may be a dental division of the medical department.

FOOD INSPECTION
The medical officer's duties include inspection of food served to the ship's company. Prevention of illness is one of his most important functions.

Medical Officer

The head of the medical department is the medical officer. He is normally the senior officer of the Medical Corps attached to and serving on board a ship. He is directly responsible, under the commanding officer, for maintaining the health of the personnel of the command and must make the necessary inspections to insure it. He also acts in an advisory capacity to the commanding officer in matters pertaining to sanitation and hygiene.

Not only must the medical officer furnish medical care and treatment to personnel assigned to the command, he must, when directed by the captain, provide these services to such other persons of the United States Armed Forces as may require them.

When circumstances require, he cooperates with local health authorities in matters affecting the health of the community. He assists such authorities in quarantine inspections and also advises the commanding officer regarding the medical aspects of pertinent quarantine regulations.

Although the supply officer receives, delivers, and ships medical and dental supplies, the medical officer is charged with procuring, inspecting, stowing, issuing, and transferring of medical supplies. (Dental supplies are similarly handled by the dental officer.)

In addition to performing the usual instructional responsibilities of department heads, the medical officer must insure that all ship's personnel are adequately trained in administering first aid.

He works in close cooperation with the dental officer, whether that officer is a department head or a division officer. If, in the course of a physical examination, he notes dental conditions that need attention, he refers such matters to the dental officer.

The medical officer is stationed in battle where he can best serve and supervise attendance on the wounded.

Dental Officer

In ships having no dental department, the dental officer serves as a division officer. In such case he is directly responsible to the commanding officer for all professional, technical and administrative matters connected with dental services. He and his subordinates may in emergency situations and in other circumstances prescribed in the organization of the command for battle, perform such duties for the care of the sick and wounded as the commanding officer may direct.

In those commands that have a dental department, the dental officer serves as department head. He is responsible, under the commanding officer, for preventing and controlling dental diseases and supervising dental hygiene within the command. He also serves as adviser to the commanding officer in such matters.

His duties in dental affairs parallel those of the medical officer in medical matters. He collaborates with the medical officer, informing him of any adverse physical condition that he may have discovered in the course of a dental examination.

Assistants

Both the medical officer and the dental officer may be assigned such officer assistants as may be necessary for efficient functioning of the department or division. Enlisted assistants are hospital and dental apprentices, hospital corpsmen, and dental technicians.

DENTAL CARE

The dental officer is assisted by enlisted dental technicians. In ships having a dental department, he is a department head; in smaller ships that have no dental department, he is a division officer.

AIR AND REPAIR DEPARTMENTS

Air Department

Aircraft carriers and seaplane tenders have an air department. Ships that do not have such a department may have an aviation division, which is a part of the gunnery or deck department, and this division head's title is aviation officer. The title of the head of the air department is air officer. This department may be composed of air divisions, air groups, and aircraft squadrons.

The air officer is charged primarily with launching and landing operations. He is also responsible for the servicing, maintenance, and repair of aircraft. Other aircraft and airborne electronic equipment assigned to the air department must also be maintained and repaired by his personnel. His operation and maintenance duties extend to all aircraft-handling equipment such as elevators, cranes, catapults and arresting gear, and seadrome equipment.

Not only servicing, but also arming of assigned aircraft must be insured by the air officer. Launching, landing, and handling operations of planes are his responsibility as are any visual traffic control measures necessary for safe, effective performance of these operations. The fuels and lubricants, and operations, maintenance, and security of the related systems are in charge of the air officer, who also maintains any records in connection with fuel and submits them daily to the commanding officer.

The air officer must undertake aircraft salvage operations in case of crash and may on occasion have opportunity to put into operation his knowledge of fire fighting. Safety precautions must be enforced by him and he must insure that in those parts of the ship where aircraft are stowed and handled and where inflammables or explosives assigned to his department are stowed, that such precautions are posted. Drill and instruction in safety matters affecting his personnel must be carried on by him.

Normally, the air officer's battle station on a carrier is in a location where he can best control flight deck operations; on a seaplane tender he is located where he can control aircraft and servicing and maintenance operations.

His assistants may include the following: assistant air officer, flight deck officer, landing signal officer, aircraft maintenance officer, aviation ordnance officer, and aviation shops officer.

Repair Department

Repair ships or tenders whose primary function is to repair other ships have a repair department that is headed by the repair officer. He is responsible under the commanding officer for the accomplishment of repairs and alterations on ships and aircraft made available for such work by competent authority.

Planning and scheduling are important in his work and he must insure the completion on time of any work assigned him. Inspection of completed work is performed to make sure that the work is done satisfactorily and in conformance to prescribed methods and standards. He must establish and maintain a smoothly functioning job order system and keep strict records of materials used and charges to be made. He also prepares estimates of funds required for the repairs accomplished by his department.

Like other department heads he is, of course, responsible for the training of his personnel, for the coordination of his department with others in the ship, for the upkeep and cleanliness of assigned spaces, for the maintenance of equipment needed in his work, and for any records and reports required.

His battle station is usually where he can perform most efficiently as officer in charge of urgent repairs. He may be assigned whatever assistants are necessary to insure that his department functions as required by *Navy Regulations*.

DIVISIONS

Variations in Size and Number

The departments of a ship are organized into divisions, which are in turn organized into watches or sections, or both. It is obvious that there can be no standard divisional organization for Navy ships because of the great variations in function, size, and complement. The complement of the divisions may vary in number from five or six members in one division to a hundred or more in another.

In small ships, one officer may hold several positions, and heads of departments seldom have assistants. There are fewer divisions and the complement of each is limited by the smaller complement of enlisted men.

As far as practicable, divisions are assigned battle stations that permit their employment as units, under their own officers and petty officers.

Division Officers

A division officer is one regularly assigned by the commanding officer to command a division of the ship's organization. The commanding officer makes these assignments in such a manner as he believes to be most conducive to the efficiency of the ship as a whole. Division officers are responsible to and in general act as assistants to the department heads.

The duties are many and varied. *Navy Regulations* require that the division officer execute all methods prescribed by and all orders received from his superiors. He must be cognizant of the needs and capabilities of his subordinates and, within his authority, may take such action as may be necessary for the efficiency of his division and the welfare and morale of his subordinates.

The division officer has the responsibility of training his subordinates in their own duties and in the duties to which they may succeed. He has an opportunity to motivate his men to strive for advancement in rating and improvement of their own education. He has disciplinary duties also, and is charged by *Navy Regulations* with suppressing any improper language or unseemly noise or disturbance. Matters deserving disciplinary action are reported by him to the executive officer.

Personal supervision and frequent inspection of spaces, equipment, and supplies assigned his division are required of him to the end that these are kept in satisfactory condition. He reports to the department head any repairs or correction of other defects that he is unable to effect.

It is his responsibility to maintain corrected copies of all bills and orders for his division and to have pertinent parts posted in conspicuous places.

Personal leadership is important to the division officer. He has frequent direct contact with the men and must see to it that they perform with diligence all duties assigned them. Especially in training his men is the division officer's leadership manifest, and his effectiveness is measured by the extent to which he fulfills his main duty: preparation of his men for battle.

FUNCTIONAL ORGANIZATION

Ship's Organization Book

The previous sections have dealt primarily with the administrative organization of the ship. Our discussion has taken us down through the administrative levels as far as the division officers who insure that their subordinates perform their routine duties in the prescribed manner.

To insure that the ship's personnel function as a well-coordinated team in any military situation there is prepared prior to the ship's commissioning a ship's organization book, a battle bill, and a watch, quarter, and station bill. These give in detail for the particular ship for which they are prepared, the assignment of officers and men in the performance of their duties.

The ship's organization book is a general directive and has the force of regulations. This book outlines in a specific manner the ship's administrative organization and contains the fire bill, collision bill, abandon ship bill, fueling bill, visit and search bill, towing bill, and other bills necessary to provide for any known contingency.

Battle Bill

The battle bill is one of three all-hands evolutions, that is, a drill in which each person aboard has a station. It is classified as confidential and lists all the stations necessary to fight the ship as well as the duties of the men at each station. Consideration in making these assignments is given to the particular qualifications of the men concerned, placing them where they are best fitted to serve. The assignment designates not only duties but indicates the succession to command in each station. The bill also provides for occasions when less than the complement is assigned or available.

COMMUNICATIONS ABOARD SHIP
Bugle calls are a quick and sure means of sending previously prepared messages to all hands.

There are several conditions of readiness for battle or for simulated war operations. The condition in operation depends on the anticipated danger.

Condition 1—The maximum state of readiness for battle, with the entire crew at battle stations prepared for imminent action.

Condition 1A—That condition of battle readiness in vessels carrying troops or material for an amphibious landing when all stations are fully manned for debarkation and unloading while at the same time the vessel is maintained in Condition 1, so far as available personnel permit.

Condition 1AA—That condition which is assumed when air action is imminent.

Condition 1E—That condition normally assumed when enemy forces of comparable surface strength may be encountered, and when it is desired that all battle stations be manned but not alerted. It is particularly appropriate as a form of rest condition to be interposed between long periods of Condition 1.

Condition 1EAA—That condition normally assumed when enemy air forces may be encountered and when it is desired that all air defense stations be manned but not alerted. It is particularly appropriate, as a form of rest condition, to be interposed between long periods of Condition 1AA.

Condition 2—That condition normally assumed when major action is improbable but surface encounter with enemy light forces, submarines, or air is a possibility.

Condition 3—That condition normally assumed when the only prospect of surprise attack is by aircraft or submarine.

The drill that is engaged in to assure rapid attainment of Condition 1 is called general quarters drill and frequent performance of it is required by *Navy Regulations.*

Watch, Quarter, and Station Bill

Based on the battle bill, the watches, the quarters for berthing and messing, the stations for battle, emergencies, and routine work, and other details of duty to be performed by or assigned to the several divisions are set forth in a general watch, quarter, and station bill.

Watches. The assignment of officers and men to watches or sections within a division is carried out in a manner that insures effective manning of the battle stations required to meet the several prescribed conditions of readiness for action. Further, consideration is given to the fact that the normal watches may be kept and that the force on board at any time is sufficient and is organized to care for the safety, operation, and maintenance of the ship.

With the exception of the commanding officer and the executive officer, every officer and every man aboard is placed in a watch section. The personnel filling the offices and stations of the watch are temporarily removed from their regular stations and duties in the ship's organization, and devote their entire attention to their watch duties.

A *watch officer* is assigned to duty in charge of a watch or a portion of a watch. The commanding officer assigns to such duty any commissioned or warrant officer whom he considers qualified; he may when conditions require, assign a petty officer to such duty. The station of the officer in charge of the watch is where he can best perform the duties assigned him, and effectively supervise and control the performance of those on watch under him. He must remain at his station until relieved.

The *engineering officer of the watch* is the officer on watch in charge of the main propulsion plant of the ship, and of the associated auxiliaries. He must insure that the engineering log, the engineer's bell book, and the prescribed operating records are properly kept, and that all orders received from the officer of the deck are promptly and properly executed.

He may be directed in the duties of the watch by the engineer officer or his assistant, either of whom may assume charge of the watch if they consider such action necessary. The engineering officer of the watch reports to the officer of the deck and to the engineer officer any defects of machinery, boiler, or auxiliaries that may affect the proper operation of the ship. He must be informed of any matters that are required for entry in the log. He insures that frequent inspections of engines and boilers are made and that all relevant safety precautions are observed. When relieved, he signs the engineering log and the engineer's bell book for his watch.

Each watch section is approximately equal not only in number but also in the experience and special qualifications of its members. In large ships there are four watch sections; the first and third sections comprise the starboard watch, and the second and fourth sections make up the port watch. In destroyers and smaller ships there are three watch sections.

Under normal peacetime conditions at sea, one of the sections of the watch is the duty section and furnishes all watchstanders. The sections not on watch engage in the ship's work and in drills. In wartime the watchstanding schedule varies with existing conditions. Under battle conditions, the ship is at general quarters and all officers and men have an assigned station.

In port after working hours (usually from 1600 to 0800), the watch not having the day's duty may have permission to go on liberty. The general practice is to have at least half of the personnel on board at all times, although this practice varies with conditions. A ship in drydock, for example, would not need half the personnel on board, whereas in port in the battle area, most of the personnel would be required to stay on board.

It is appropriate in this discussion of watches to mention the logs that must be kept, to constitute the official records of the command. *Navy Regulations* require that a deck log and an engineering log be maintained by each ship in commission. A quartermaster's notebook and an engineer's bell book are also required as adjuncts, respectively, to the deck log and the engineering log.

No erasures may be made in such records. Corrections, additions, or changes may be made only by the person required to sign the record for the watch. After the commanding officer signs the log, no changes are permitted. Changes requested by the commanding officer are made by the person keeping the log only if he considers them correct; otherwise the commanding officer enters over his signature such remarks as he may deem appropriate.

The *deck log* is a complete daily record, by watches, in which are described every circumstance and occurrence of importance or interest that concern the crew and the operation and safety of the ship, or that may be of historical value. The navigator has over-all responsibility for preparation and care of the deck log. The type of material to be included in the deck log is specifically stated in *Navy Regulations* and includes data such as the ship's operating orders, its courses and speeds, position, state of the sea and weather, damage or accident to the ship or its cargo, deaths or injuries to personnel, records of meeting or adjourning of courts-martial and other formal boards, and changes in the status of ship's personnel or passengers. Reports of all routine inspections must be entered in the log which serves as a record, therefore, of whether or not such inspections have been made.

INSPECTION OF MESS PERSONNEL
Good food is important and cleanliness is essential in its production. Here the chief master-at-arms inspects mess cooks before noon meal aboard a battleship.

The manner and form for preparing the log are prescribed by the Chief of Naval Personnel.

The *quartermaster's notebook* is a chronological record of events occurring during the watch. Entries in the quartermaster's notebook are made at the time of occurrence or when knowledge of such occurrence is first obtained. The quartermaster's notebook is signed by the quartermaster of the watch on being relieved.

The *engineering log* is a complete daily record, by watches, of important events and data pertaining to the engineering department and the operation of the ship's propulsion plant. The Chief of the Bureau of Ships prescribes the manner and the form to be employed in preparing the engineering log; the specific data required are set forth in *Navy Regulations.*

The *engineer's bell book* is a chronological record of orders pertaining to the speed of the engines. It shows, for each shaft to which it pertains, the time each order regarding a change in propeller speed is received, the meaning of such order, and the revolutions per minute resulting from action taken in obedience to such order. Entries in the bell book are made at the time of receipt of each order.

Quarters. The space provided for the officers' living quarters is usually located near the wardroom and this section is called officers' country. Senior officers, if accommodations permit, are assigned individual staterooms. Junior officers share staterooms with one or more officers or are assigned to a bunkroom. The warrant officers are usually furnished accommodations similar to those of junior officers, and the chief petty officers are bunked together in separate compartments. The enlisted men are bunked in large compartments containing tiered bunks and metal lockers.

Messes on battleships normally are five in number. (Enlisted men are furnished their food by the Government, whereas officers must pay for their food since they are paid a subsistence allowance to cover the cost of meals.) These messes are in general as follows:

Cabin mess: for the captain

Wardroom mess: for all officers of the rank of ensign and above

Warrant officers' mess: for all warrant and chief warrant officers (This is sometimes combined with the wardroom mess.)

Chief petty officers' mess: for all chief petty officers

General mess: for all enlisted men except chief petty officers

CHIEF PETTY OFFICERS' MESS
Good food keeps morale high. Here the chief petty officers of a light cruiser are finishing their evening meal.

On smaller vessels, these messes are combined; for example, on a destroyer there would be a wardroom mess, a chief petty officers' mess, and a general mess.

Stations. Division officers prepare complete and detailed station bills and these, on being approved, are posted in a prominent place in the division's part of the ship. The station bill shows the name, rate, billet number, and locker number of each man in the division. In addition, it indicates his battle station (Conditions 1, 2, 3), fire station, fire and rescue station, collision station, abandon ship station (with equipment to be provided), special station for getting underway and anchoring, his sea watch station, port watch station, and cleaning station.

As far as practicable men are berthed and assigned training stations adjacent to their battle stations.

OFFICER OF THE DECK

Status

The officer of the deck (OOD) is designated by *Navy Regulations* as the officer on watch in charge of the ship. Every person on board who is subject to the orders of the commanding officer, except the executive officer, is subordinate to the officer of the deck.

The executive officer may direct the officer of the deck in matters pertaining to general duties and the safety of the ship. When the captain considers it advisable, he may delegate to another officer, for a specified watch, the executive officer's duties in connection with the officer of the deck. If an emergency arises in the absence of the commanding officer, the executive may take charge of the deck. The commanding officer may authorize the navigator to relieve the officer of the deck if in his opinion such action is necessary to insure the safety of the ship.

Manner of Performing Duty

The officer of the deck must have complete knowledge of and adhere rigidly to the policies of the captain and the executive officer. In no position more than that of the officer of the deck is eternal vigilance the price of safety. The comfort and contentment of others must receive his consideration, and he must bear in mind that every request handled is a potential troublemaker if not properly decided. The officer of the deck, by his bearing, alertness, scrupulous attention to details of duty, and capable manner of discharging authority, is a vital factor in furthering the efficiency of the ship and exerts an important influence upon the men.

Underway the officer of the deck takes a position on the bridge where he may advantageously determine the proper action for the safe handling of the ship. In port his station is on the quarterdeck.

Uniform Regulations requires that the officer of the deck wear gloves and carry binoculars or a spyglass in port and that he carry binoculars at sea. Side arms may be prescribed by competent authority.

An officer of the deck is the commanding officer's representative. It takes months of actual practice and experience to become proficient in the performance of the duties of this position. He should have not only a sound basis of technical knowledge combined with forehandedness, vigilance, common sense, leadership, and experience, but must also possess a thorough knowledge of what is required of him by *Navy Regulations*. The Rules of the Road must be well known to him. The small volume, *Watch Officer's Guide*, is an invaluable help to the young officer of the deck.

He may be assisted by a junior officer of the deck (JOOD) who in this way acquires the experience necessary for standing regular watches as officer of the deck.

Navigation Responsibilities

By *Navy Regulations* the officer of the deck is charged with responsibility for the ship's safety. When at sea and especially when approaching land or shoal waters he is required to keep himself informed of the position of the ship and of all particulars that may be of use in keeping the ship out of danger. He must be able to anticipate danger as well as take effective measures for avoiding it. During low visibility, or whenever circumstances warrant, he is authorized to assign additional lookouts.

He must see to it that the lights required by law for prevention of collisions are correct as to number, color, and location, and that they are kept burning from sunset to sunrise. Half-hourly inspection must be made in this connection.

When his ship is steaming in formation, its assigned station must be maintained. It must be skillfully steered and kept on its course. The navigator advises the officer of the deck of a safe course to be followed and he regards such advice as sufficient authority to change the course; but otherwise, unless ordered by the commanding officer or unless such action is necessary to prevent collision or imminent danger, he is not authorized to change either the course or the speed. Further he is not authorized to make official signals, unless the captain orders them or unless they are necessary to warn others in company of immediate danger.

Boats

The officer of the deck has several responsibilities in connection with the ship's boats. He must insure that boats and crews present at all times a creditable appearance, that they are handled smartly, properly manned and equipped, and not loaded beyond their capacity. The crews must observe the rules for preventing collisions and the regulations pertaining to honors and ceremonies; they must in addition understand how to use the boats and observe all pertinent safety precautions. *Navy Regulations* charges the officer of the deck with securing of all boats not in use.

Other boats or aircraft sighted must be watched in order that aid may be sent to them if necessary. The officer of the deck must be informed of any boats or other craft that come alongside or leave the ship. When materials or services arrive that require the knowledge or action of certain officers, the officer of the deck must insure that these officers are promptly notified.

Inspections

The officer of the deck must have frequent inspections made to insure the security of the ship. If such inspections have not been made by another regularly established watch, they must be performed by the members of his watch. These inspections extend to matters such as watertight integrity and condition of the armament and of the ground tackle or mooring lines in use. The good order and discipline of the crew, inasmuch as they are factors that contribute much to the security of the ship, must be noted by him. Inspections below decks may be made by the junior officer of the deck.

When in port, the coxswains of the lifeboats are required to inspect and report to him at sunset the condition of their boats as to readiness for service. At sea, a similar inspection and report must be made to him at the beginning of each watch.

When at anchor the officer of the deck must take proper precautions to detect and prevent dragging.

Reports

On being relieved, the officer of the deck must sign the rough deck log, after making certain that the entries for his watch are complete, accurate, and clear.

In matters that affect or may affect the safety of the ship, its personnel, or ships in company, he is required by *Navy Regulations* to report promptly to the commanding officer. Vessels, aircraft, or wrecks detected; land, shoals, rocks, lighthouses, beacons, or buoys sighted; marked changes in the barometer, wind, state of the sea, or indications or warning of storms—in short, all occurrences worthy of the notice of the commanding officer are reported to him by the officer of the deck.

Personnel aboard are required to report to the officer of the deck any occurrence or condition that may in any way affect the safety of the ship, or that should be included in the record for his watch.

Miscellaneous Duties

At various times the officer of the deck may function as an alert policeman or as a gracious host. The men performing their assigned duties about the ship are constantly under his observation, for he is responsible for prompt and precise execution of the ship's established routine and of any special orders. He must see that the men observe all pertinent safety precautions, especially in heavy weather and when they are working aloft or over the side. Their safety when they are handling explosives or other dangerous materials is his responsibility. He must insure that when the cry, "Man overboard!" is heard, the means for rescue are ready for instant use.

He is required to take measures for preventing personnel from bringing aboard unauthorized articles and takes similar action on observing removal of certain articles from the ship. Personnel over whom he has authority must report to him or to his representative on leaving or returning to the ship; on leaving, they must report authority to do so.

All persons coming aboard or alongside must be treated courteously. The officer of the deck, unless prevented by urgent duty, is expected to be at the gangway to receive all officers or distinguished visitors; when they leave, he accompanies them to the side. When salutes, honors, and ceremonies are in order, the officer of the deck must insure that they are properly performed.

CHAPTER 13

TYPES AND CHARACTERISTICS OF NAVAL VESSELS

Part I—Large Combatant Vessels

INTRODUCTION

At the end of World War II the United States Navy was by far the strongest in the world. In the amount of tonnage constructed, in the quality of our ships, and in the diversity of types which we have created, the record is one of unparalleled achievement.

While the United States had been augmenting the fleet from time to time since the early 1930's, it was not until the Two-Ocean Navy Bill became law on 19 July 1940 that effective steps were taken to prepare for our possible entry into war. In round numbers, provision for a two-ocean Navy meant an increase of about 70 percent in our combat tonnage—the largest single building program ever undertaken by the United States or any other country.

Upon the outbreak of war in Europe in September 1939, the Navy Department initiated expansion of naval shipbuilding facilities in private yards and in naval shipyards. By July 1940 when the two-ocean Navy was authorized, the program for expanding shipbuilding facilities was well started, and it continued thereafter at an accelerated rate until the close of hostilities. The problem was not merely one of expanding shipyards but of expanding the manufacturing capacity of industry as a whole to meet the needs of the naval shipbuilding program. Some idea of the capacity of United States shipbuilding facilities can be gained from the following data. From 1 March 1945 to 1 October 1945 these combatant ships were completed: 4 aircraft carriers (one of which was USS *Midway*, the first of three 45,000-ton carriers), 8 escort carriers, 3 light cruisers, 6 heavy cruisers, 53 destroyers, 2 destroyer escorts, and 24 submarines. During this same period, over 300 auxiliary ships were completed; the landing craft and district craft construction programs were continued; and several minesweeping vessels and repair ships were delivered.

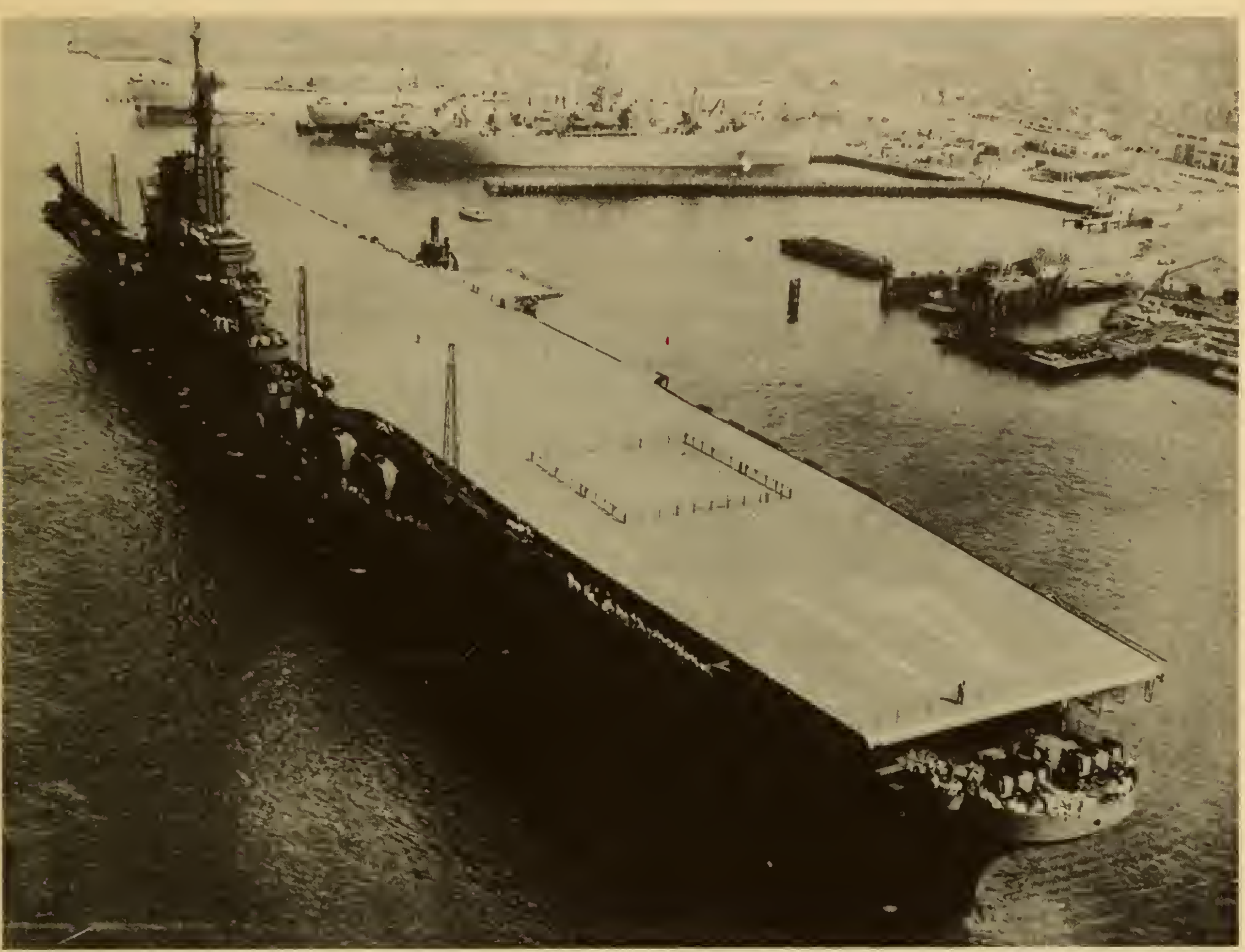
AIRCRAFT CARRIERS (CVA, CVB, CV, CVL, CVE)

Purpose

The modern aircraft carrier is the only really new type of warship produced during this century, and it has won for itself a foremost place in the fleet. The construction of these ships during the war represented one of the most spectacular phases of the naval shipbuilding program.

Probably nothing has ever changed the methods of naval warfare more than the aircraft carrier. No longer do great fleets line up in battle formation for major engagements on the high seas. The use of aircraft has made it possible for fleets to fight each other while hundreds of miles apart. The carriers are mobile bases for planes, capable of moving aircraft into striking distance of vast areas formerly inaccessible.

The basic difference between aircraft carriers and other large fighting ships of the fleet is that their armament consists principally of planes instead of



USS *MIDWAY* (CVB41)
When launched, the *Midway* was described as the heaviest, strongest, fastest carrier ever built.

guns. Strategically, they are warships which strike their offensive blows not through guns or torpedo tubes, but through aircraft capable of great range in comparison to the former.

The aircraft on carriers or carrier escorts have four main functions:

1. They are used as scouts to locate and observe enemy forces or watch for hostile aircraft.
2. They launch initial long-range attacks against enemy forces. Carrier planes can attack enemy bases thousands of miles from an airfield, far out of the range of our own land-based aircraft. They can attack enemy fleets at sea while the carriers remain at a distance.
3. Carrier planes provide our own ships with air protection against enemy aircraft.
4. Planes may be used on antisubmarine patrols to spot submarines from the air and to sink them.

The chief function of the carrier itself is to carry, launch, and handle aircraft quickly and effectively. The carrier must approach the enemy unseen, at swift speed, launch its planes for the attack, recover them, and get away before its position can be discovered. The carrier uses its fighters and AA guns as an aid in protecting itself from enemy air attack.

The aircraft carrier is the center of a modern naval tactical unit, because of its long-range offensive power and its limited defensive ability. It is a powerful offensive weapon, but it cannot protect itself adequately alone.

Structural Factors

Featured in a carrier's construction are: a large unobstructed flight deck; a hangar deck for plane stowage; large and rapid elevators, almost as large as tennis courts, permitting swift movements of planes from one deck to another; extensive space for repair shops, living quarters, and operational equipment; engines which will provide the speed necessary for her planes to take off and land. The main emphasis is placed on *speed*, *seaworthiness*, *plane-carrying capacity*, and *protection* in the large types against bombs and torpedoes.

Below the flight deck is the hangar deck. Here are shops which make it a counterpart of the modern hangar ashore. Opening into a large compartment, devoid of obstructions, are the wing, engine, and metal shops. Nearby are storerooms containing spare parts which make possible rapid repairs to damaged planes.

On the more recent carriers, each squadron has an individual ready room which is located near the flight deck. Officers assemble here for last-minute briefing of orders prior to take-off. Normally about fifty desks are provided; also a blackboard and a bulletin board containing all available information pertaining to the operation at hand. Nearby are dials which record automatically the force and direction of the wind and the speed and course of the ship.

Rockets and hydraulically operated catapults enable the planes to take off in a much shorter distance than is normally required for this operation. Arresting gear and special safety screens are used in landing aircraft on the carrier's deck.

Carrier displacement ranges from 8,500 tons (CVE) to 45,000 tons (CVB); the speed range is from 16 knots to about 33 knots. The length varies from 500 feet to 1,000 feet.

The armament of an aircraft carrier consists of 5-inch dual-purpose antiaircraft guns and an extremely large number of rapid-fire, automatic weapons.

The commanding officer, executive officer, operations officer, navigator, and air officer are usually naval aviators.

Considerable improvements have recently been made toward protection from underwater damage. The underwater protection of the CVB and CV is comparable to that of battleships, while the armor protection of these carrier types is somewhat greater than that of cruisers. When operating, aircraft carriers must have accompanying cruisers and destroyers for protection.

USS *PHILIPPINE SEA* (CV47)
The *Philippine Sea*, named for one of the decisive battles of World War II, is one of the latest carriers.

THE AMAZING CVE
The escort carrier was a development of World War II that time and again proved its worth in battle.

Background of Aircraft Carriers

The first operation of a landplane on a Navy ship occurred in 1910. Although ships called "aircraft carriers" made their appearance during World War I, none had flight decks large enough to permit planes to alight as well as to take off. Planes which took off from their decks, upon their return usually landed on the water where they floated on air bags until hoisted to the mother vessel. There were also seaplane carriers which functioned simply as tenders, using derricks to lower and hoist the planes to the water. The first vessel designed with a clear deck which could be used for taking off and alighting was the British ship *Argus*, completed in September 1918, unfortunately too late to be of any use in the war.

Our first aircraft carrier, the *Langley*, was given the nickname, "The Covered Wagon," because of her close resemblance to the old covered wagon of prairie fame, when viewed in silhouette. The partly completed battle cruisers *Lexington* and *Saratoga* were converted and commissioned as carriers in 1927 followed in 1934 by the *Ranger*, our first ship originally designed as an aircraft carrier. From much data gathered through the adolescent years of carrier operation and the hard knocks of experience, the Navy designed its present-type carriers. The *Yorktown* (1937) and *Enterprise* (1938) incorporated all known improvements in operating facilities and design at the time they were built.

Our foothold in the Solomons was made possible by the successful employment of our carriers and their attached aircraft. Our greatest victory in 1942 resulted from the proper use of carrier-based aircraft in the Battle of Midway.

Chapter 18, "Naval Aviation," contains additional information on the background of carriers.

Types of Carriers

There are four general types of carriers: the very large *Midway* class, displacing 45,000 tons; the *Essex* class of 27,100 tons; the so-called light carrier built on cruiser hulls and of 11,000 to 14,500 tons, and finally the escort carriers which are built up from merchant type hulls. The first three of these have speeds in excess of 30 knots and are designed for full-scale combat operations.

Construction of a new, larger carrier was authorized early in 1948. Estimated cost of this carrier is $124,000,000 and its length exceeds that of the *Midway* class by 122 feet. Approximately four years would be required for completion of this carrier, the CVA 58. (See pages 263 and 264.)

The *Essex* class is perhaps most representative for our purposes today, since it represents the bulk of our wartime construction and current availability. This is a vessel of 27,100 tons' displacement (as previously stated) and has a speed of about 33 knots. It is big, highly maneuverable, and tough. It has fine radar equipment, including carrier-controlled approach installation on some of this class for bad weather conditions. The hangar deck is armored as is the waterline of the hull. The flight deck is unarmored, and during World War II this proved to be a weakness. However, ships of this class were hit repeatedly and some took severe damage, but not one was sunk.

The carrier is complete as a base of operations for its embarked aircraft. As such it is furnished with the physical equipments normal to operating aircraft from a similar base ashore. In addition to its providing a base for operations of its embarked aircraft, it also provides for the "field" repairs, maintenance, servic-

USS *SAIPAN* (CVL48)
Aerial view of the *Saipan* (taken at an altitude of 500 feet) shows the carrier as a mobile landing field. The *Saipan* is one of the largest ships of this type and was in the process of construction during the final stages of World War II.

USS *RANGER* (CV4)
The *Ranger* is our first ship originally designed as a carrier.

ing, to include changing of wings, engines, landing gear, radios, radars, and so on, but not major overhaul. The carrier provides for all of the requirements of the embarked air group and its personnel over the most extended period of operations.

The flight deck and the hangar deck with their service adjuncts such as aircraft elevators, rearming elevators, catapults, arresting gear, night lighting, visual, electronic, and mechanical control devices, and the carefully trained team of skilled personnel who operate them—this grouping is the heart of the aircraft carrier in providing the mechanics of operations. The flight deck is about 880 feet long, a little over 100 feet wide, with an area of about two acres. The island structure on the starboard side contains those stations for personnel and equipments necessary to control of the carrier itself and its embarked aircraft.

The *Essex* class normally operates about 100 aircraft. This loading varies somewhat, depending on the preponderance of one or more types of aircraft in the air group, which in turn depends on the job at hand. For example, if the loading were primarily with fighters, the carrier could operate more aircraft than if the loading were composite, that is, approximately an equal mixture of fighters and attack aircraft.

Carriers are subject to two major hazards. They present a larger target than other ships of comparable displacement. Also, since they carry large quantities of aviation gasoline and bombs, they are more vulnerable to attacks by enemy weapons, including torpedoes and bombs, than ships of comparable size

Carrier data	*CVB*	[illegible]
Standard displacement*	45,000 tons	27,100 tons
Length over-all	968 feet	8[illegible] feet
Length on water	900 feet	820 feet
Extreme beam above main deck	136 feet	129 feet
Maximum navigational draft	35 feet	32 feet
Shaft horsepower	212,000	150,000
Trial speed	33 knots	33 knots
Complement	over 3,000	over 2,500
Planes	over 70	over 70

BATTLESHIPS (BB)

Purpose

The battleship, which has been given the arbitrary designation BB, is built to defeat the most powerful vessel that the enemy can put to sea. Its combination of offensive and defensive power is the greatest possible in a single vessel. In the past, the battleship was considered the principal ship of the fleet. Although the aircraft carrier has become the principal offensive-type ship, recent battle experience tends to show that the two types supplement rather than replace each other as the major units of a modern fleet.

On the subject of battleships Admiral King has said, "The new applications of naval gunfire in amphibious operations, as well as fleet actions, have demonstrated that the battleship is a versatile and essential vessel, far from obsolete."

Armament

Battleships carry the heaviest guns afloat. Their main batteries range from twelve 14-inch guns on USS *California* to nine 16-inch guns on USS *Missouri*. Secondary armament consists of as many as twenty twin 5-inch 38-caliber dual-purpose guns. In addition, a varying number of 40-mm and 20-mm antiaircraft heavy machine guns are installed.

Armor

The heaviest armor in battleships, on the turrets and conning tower, is 16 inches in thickness. The side armor usually consists of a belt more than 12 inches in thickness and at least one deck height in width, extending along the waterline over the long, central portion which houses the ship's vitals. Protection against high-angle fire and aerial bombs is provided by an armored deck about 5 inches thick. Armor belt is now placed well inside the ship's hull instead of

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* The United States Navy does not publish figures covering operating displacement. Standard displacement represents a condition when the ship is more or less ready for sea but does not include such items as fuel and fresh water.

USS *MISSOURI* (BB63)
A modern battleship is a mighty ship, incorporating great offensive and defensive power.

on the outside of the ship, and the outer layer or layers are filled with fuel oil or are voids. Various systems for protection against underwater explosion are in use in the navies of the world. These systems are based on a combination of varying thicknesses of armor and cellular type of ship compartmentation.

Functions

The battleship is capable of speed up to 32 knots and has a large cruising range. It has good seakeeping ability, can withstand high seas and heavy weather, and has the stability required to provide a satisfactory gun platform.

Battleships are built and designed to accomplish two major objectives: to engage and sink any and all types of enemy ships by long-range gunfire; and to deliver heavy and continuous bombardment against enemy harbors and shore installations. The terrific hitting power of our battleships was clearly demonstrated in the past war during such engagements as the crippling of the French battleship *Jean Bart* at Casablanca, the Allied landings in Sicily, and the battle of Savo Island.

Despite the great emphasis on protection in a battleship, it is armament and not armor that makes a fighting ship. The basic purpose of a battleship's armor and defensive armament is to keep its main battery guns in action. These vessels are still vulnerable to aerial bombs and torpedoes, and to torpedo attacks by submarines and other torpedo-carrying vessels.

Whether actually in action or merely threatening it, battleships represent great power. As a part of a task force, they add power to hit-and-run raids on enemy positions. When used to aid in escorting convoys the mere presence of a battleship may serve to keep lesser enemy surface ships at a safe distance.

A battleship's strength, power, antiaircraft defenses, speed, range, and great number of guns provide essential defensive qualities to the offensive task forces. This was recognized during the recent war and was proved again in post-war Atlantic fleet exercises.

The Battleship as a Flagship. The comparative invulnerability of the battleship has caused its use as a flagship since, by virtue of the duties of command, the last ship afloat should carry the task force commander. That this is possible in a battleship was well demonstrated by USS *North Carolina* in World War II when it passed successively through four task forces, each of which had been dissolved by carrier losses.

Another advantage in the use of the battleship as a flagship is that it may be so placed in a task force that air operations on all carriers may be observed from the battleship, without the commander's becoming involved in the details of any one, thereby permitting more comprehensive control of the entire operation.

Added to all these considerations is the fact that the range and speed of the fast battleship permit its use with any type of ship in all kinds of weather. Thus, it may be demonstrated that the basic factor in the use of the fast battleship as a flagship is in the provision for increased efficiency in command functions and space for command facilities.

USS *Missouri*

A brief description of USS *Missouri*, one of the newest and most formidable battleships in our Navy, will be helpful in gaining an impression of the size and facilities of such a ship. The cost of the *Missouri* was approximately $100,000,000.

Her standard displacement is 45,000 tons, and her length is slightly more than 887 feet. This great length permits several marked advantages. It allows more space for boilers and machinery as well as a better designed underwater hull, which results in her ability to attain a speed of about 32 knots: it also accounts for the great number of antiaircraft guns that are installed.

Her main battery is composed of nine 16-inch guns disposed in three triple-gun turrets, two of which are forward of the control tower and the third one abaft the superstructure. This arrangement permits all nine guns to be fired on both broadsides. As each 16-inch projectile weighs well over a ton, more than 10 tons of metal are hurled approximately 20 miles by each broadside. For example, assuming the moderate rate of one salvo per minute, the weight of metal that can be delivered in one hour from these broadside guns alone would be 600 tons. With the high velocity of the projectile, the exactness in the fire-control instruments, and the expertness of personnel, high accuracy of fire is attained to great distances. Her secondary battery consists of twenty 5″/38 dual-purpose guns, nineteen 40-millimeter antiaircraft guns, and many machine guns.

Not only must the ship be able to steam fast, fight hard, and withstand punishment, but she must also be self-sustaining for at least three months. To enable her to remain at sea for this length of time, the ship's storerooms are of sufficient capacity to carry supplies for herself and more than 2,000 officers and men. The large distilling plant is capable of supplying all the fresh water needed for the personnel and for the boilers which provide steam for running the engines.

To insure efficient and adequate communications among all parts of the ship and to furnish heat, light, and power for the hundreds of pumps, motors, air compressors, and many other types of auxiliaries necessary to keep this vast machine going, there are miles of electric cables, telephone wires, voice tubes, steam pipes, water pipes, and air ducts. The ship can be sealed for black-out purposes and to insure protection against poison gases. All this intricate machinery is kept in efficient operation by the ship's own shops, fitted with all the latest and best equipment for the carpenter, machinist, boilermaker, electrician, shipfitter, and optician. There are expert enlisted men in each branch to operate these shops.

To satisfy the usual wants of the men there are two stores which sell, at reduced prices, cigarettes, tobacco, candy, toilet articles, and many other commodities which men away from shore may need or desire. There is a large soda fountain where ice cream and soft drinks are available, a barber shop, a tailor shop, and a shoe repair shop. These stores and shops are included in the ship's store and are operated by the supply officer. In addition to these services there is a United States Post Office fully equipped for the sale of stamps and money orders as well as for the registration of letters.

A chaplain attends to the crew's spiritual wants, helps with advice or counsel on many varied subjects and holds church services every Sunday in a roomy compartment of the ship especially set aside for that purpose. In addition, to insure the physical well-being of the officers and men, there are several doctors and dentists, with a well-equipped dispensary, operating room, dental chairs, and sick-bay.

BB data

Standard displacement	32,300-45,000 tons
Over-all length	624-887 feet
Extreme beam	108-114 feet
Maximum navigation draft	34-28 feet
Shaft horsepower	28,000-212,000
Trial speed	20-32 knots
Complement	Over 1500

CRUISERS (CB, CA, CL)

Role of Cruisers

Cruisers are the general utility ships of the Navy. They can operate alone, in groups, or with the battle fleet. Since one object of naval warfare is to control maritime communications there must be a numerous class of vessels specially adapted for patrol. These must be fast, of long range, and powerfully enough armed to cope with detached units of the enemy fleet. Vessels which possess such qualifications are also admirably adapted for service with the fleet in the following roles: scouts, protective screens against destroyer attacks, leaders of destroyer flotillas, leaders of destroyer attacks against the enemy, antiaircraft screens, aircraft carrier guards, and support for amphibious operations. The vessels which fulfill these requirements are cruisers.

After Pearl Harbor, we had to build our hopes around aircraft carriers and cruisers. Back in 1812, we were cruiser-minded. Much of our naval tradition and history were written by the *Constitution*, the *Constellation*, the *United States*, and others of our original frigates which were the cruisers of the day. Individually our modern cruisers have always been superior ships.

USS *TOLEDO* (CA133)
Heavy cruisers were effective in World War II in shelling shore installations.

USS *GUAM* (CB2)
USS Guam is one of the Navy's new cruisers. Aerial view shows her long, sleek lines.

Characteristics and Functions

Cruisers today are medium-sized ships with high speed, medium-caliber guns, large cruising radius, moderate protection, and excellent seakeeping ability. Some modern American cruisers have hangars below decks which can accommodate aircraft (used for scouting and spotting). The type is divided, in the United States Navy, into *heavy* and *light* cruisers — solely on the basis of armament. Those carrying main battery guns over six inches in caliber are classed as heavy. Those with guns of caliber six inches and under are classed as light.

Cruisers cannot be so heavily protected as battleships since the type of operation for which they are designed requires very high speeds. Side armor varies with the individual classes from three inches to six inches in thickness. Cruisers have armored decks which are of sufficient thickness to give protection against moderate-sized bombs as well as gunfire.

The larger task force is built around carriers as the nucleus and it has battleships, cruisers, and destroyers in the screen. The cruisers are provided primarily because they mount powerful and concentrated antiaircraft batteries. Cruisers have also performed exceptionally well in sudden bombardment raids on enemy shore installations.

In the past the cruiser has been considered of great value as a surface raider, a protector of merchant shipping. Developments of World War II, however, have decreased the effectiveness of any surface ship as a raider and this role is now shared by aircraft and submarines. Any raider must be able to avoid detection for a considerable period of time and the cruiser found this difficult indeed with the increased communication facilities and extensive use of radar-equipped planes for scouting.

The cruiser still remains a heavy-hitting ship, capable of furnishing artillery support for landing operations. As part of the screen in a fast carrier task force these ships provide considerable protection. Their

USS *CLEVELAND* (CL55)
The light cruiser is speedy, well armed, and has a considerable cruising range. It has performed as part of the screen of a fast task force.

ability to travel long distances with infrequent refueling made them especially adapted for the war in the Pacific.

Large Cruisers (CB)

The design of the CB was the result of a series of studies commenced after we were no longer bound by any limitations on the size of ships. Six CB's were authorized in July 1940. (Three were cancelled in 1943.) The *Alaska* and *Guam* were completed in 1944 but not early enough for a comprehensive evaluation to be made of their performance in actual combat. Both the *Alaska* and the *Guam* were fitted as flagships. Their trial speed is slightly over 31 knots and their standard displacement is 27,000 tons.

Their main battery armament consists of nine 12″/50 caliber guns mounted in three turrets, their secondary armament is twelve 5″/38 caliber guns, and they have a number of 20- and 40-millimeter guns.

Heavy Cruisers (CA)

Heavy cruisers perform all the essential duties of their class. Their speed was formerly greater than that of battleships but this advantage has been almost completely nullified by the development of fast BB's; their armor protection is considerably less than that of the battleship. Heavy cruisers were effective in World War II in shelling shore installations for they are surpassed in armament only by the battleship.

CA data

Standard displacement	9,950-17,000 tons
Over-all length	588-717 feet
Extreme beam	62-76 feet
Maximum navigation draft	24-27 feet
Shaft horsepower	107,000-120,000
Trial speed	32 knots
Complement	Over 1,000

One of the most impressive features of the newer ships in the Navy is the tremendous increase in firepower. A comparison between the heavy cruiser *Des Moines*, completed after the war, and the *Pensacola*, commissioned in 1930, will serve as an illustration. The former is far more powerful in dual-purpose guns and in smaller antiaircraft guns, and has an over-all firepower that is well over 100 percent greater than the *Pensacola* as originally built.

Light Cruisers (CL)

Light cruisers carry from twelve to fifteen 6-inch guns, from eight to twelve 5″/38's, and a large number of 40-millimeter antiaircraft guns. Included in this type are some of the fastest cruisers afloat in the world today.

CL data

Standard displacement	6,000-14,700 tons
Over-all length	541-679 feet
Extreme beam	55+-70+ feet
Maximum navigation draft	24-26 feet
Shaft horsepower	75,000-120,000
Trial speed	31-33 knots
Complement	Over 800

These vessels played an important part in World War II. Their cruising range is in some cases as great as 15,000 miles, and they performed capably as part of the screen of a fast task force. Some of those on escort duty could make the round trip across the Atlantic without refueling and could even supply fuel to some of the accompanying destroyers while at sea.

The offensive strength of cruisers is apt to be underestimated by the layman. The 6-inch gun may seem to be a light piece compared to the huge 16-inch armament of a battleship, but it should be remembered that in land warfare, a 6-inch rifle is considered a very large field piece. A 6-inch projectile weighs approximately 100 pounds and can be used quite effectively at ranges up to 10 miles. The 8-inch gun hurls a projectile weighing about 250 pounds up to about 14 miles, and has far greater penetrative power than the 6-inch gun. However, the 6-inch gun can be carried in greater quantity on a vessel of a given size, and can be fired much more rapidly. The volume of fire of the modern light cruisers is really tremendous, some being capable of hurling about 150 aimed projectiles per minute (10 per gun) for a short period from their main batteries.

That the 6-inch gun is a powerful weapon is proved by the Battle of the River Plate, where the 10,000-ton German pocket battleship *Graf Spee*, mounting six 11-inch and eight 5.9-inch guns, was so decisively defeated by a British squadron composed of one heavy and two light cruisers that she retreated into Montevideo and was later scuttled by her own crew. The heavy cruiser *Exeter* was knocked out early in the engagement by the *Graf Spee*, so actually the victory may be credited to the two light cruisers *Ajax* and *Achilles*, each of which mounted only eight 6-inch guns. Speed and maneuverability plus high volume of fire, all characteristics of cruisers, undoubtedly enabled these ships to conclude successfully this action.

Other illustrations of the use of cruisers are:

1. *Raider*—German cruiser *Emden* in World War I sank over 70,000 tons of shipping in a career lasting only two months.
2. *Scouts*—British heavy cruisers *Norfolk* and *Suffolk* sought out and maintained temporary contact with German battleship *Bismarck*.

DESTROYERS (DD)

Purpose and Description

Destroyers are multipurpose ships which are useful in almost any kind of naval operation. They are designed to be swiftly moving platforms on which to place armament. Basically, they are intended to attack larger ships with torpedoes launched from tubes mounted on deck. Their primary qualities are armament and speed. Our new destroyers are streamlined, incorporating the latest and best features in speed, mobility, offense, and defense.

The DD's mount from five to sixteen 21-inch torpedo tubes; they also carry from four to six 5-inch guns, as well as numerous antiaircraft guns, mines, and depth charges which are projected from throwers or dropped from racks. Modern destroyers carry the most up-to-date and complete equipment for detection of enemy units and for fire control.

They are fast ships, with exceptionally large power plants and no armor protection except against bomb and projectile splinters and fragments in vital locations. Their protection against larger vessels is their speed and maneuverability and the use of smoke. Destroyers usually attack by night or through smoke screens by day, and are most effective when operating in groups, making simultaneous attacks from different directions. Although the destroyer is not easy to hit from the air, its unarmored character makes it susceptible to injury even from the lighter types of bombs. Another weakness is its limited endurance, for American destroyers are capable of cruising, at economical speeds, only about 6,000 sea miles without refueling.

The duties and uses of DD's are multitudinous and have at various times included the following: a protective screen against enemy submarine, destroyer, or light cruiser attack; a striking force against heavy enemy units; smoke-screen layers; short-range scouts; antiaircraft screens; plane-guards for carriers; escort ships for convoys; and support for landing operations.

DD data

Standard displacement	1620-2425 tons
Over-all length	348-390+ feet
Extreme beam	36-40+ feet
Maximum navigational draft	15-18+ feet
Shaft horsepower	47,500-60,000
Speed	31-35 knots
Complement	200-325

Destroyers of the *Fletcher* class have a standard displacement of 2,050 tons and their trial speed is slightly in excess of 35 knots. This class mounts five 5″/38 dual-purpose guns in the main battery. Deck torpedo mounts consist of one 21-inch quintuple mount, and antiaircraft guns number three 40-mm twin mounts and two 40-mm quadruple mounts.

Background of the Destroyer

In 1886 Congress authorized the building of our first torpedo boat. It was the *Cushing*, commissioned in 1890. She was 150 feet long and could make 22.5 knots with her 1720-horsepower engines. Her torpedoes could travel about a mile, but were effective only within 500 to 600 yards. Even at that time European navies had torpedo boats 225 feet long which could make a speed of 30 knots or slightly better.

The Spanish-American War gave considerable impetus to the torpedo boat and to the torpedo boat destroyer. The latter became larger and guns were mounted on them. The process continued until now

DESTROYER IN POST-WAR MANEUVERS
USS *R. H. McCard* (DD822), one of our newest destroyers, in post-war maneuvers (1948) in the Caribbean.

the term "destroyer" does not mean simply a craft to destroy others of its kind but a deadly tool fitted to destroy anything which floats on the surface of the seas, swims under the water, or flies above it. The name "destroyer" comes down to us through many mutations, but no craft is better named, no craft fulfills more closely the promise of its title.

We built 35 torpedo boats, from the *Cushing* in 1886 to the *Wilkes* in 1898. In the year of the Spanish-American War, Congress authorized the building of 16 torpedo boat destroyers, the first in our Navy. These ships displaced about 325 tons and could make a speed of 30 knots.

Torpedo boats and destroyers played an unimportant part in the war with Spain. The Spanish destroyers *Pluton* and *Furor* with Cervera's squadron at Santiago constituted a threat to the American fleet but never more than that. Although the two vessels were potentially dangerous, the Spaniards were unable to utilize their power.

The Russo-Japanese War was commenced by the Japanese in typical fashion. They attacked Russian ships with the newest, deadliest weapon of the day — a torpedo attack on the ships of a nation with whom they were still at peace. Torpedo boats and destroyers, particularly those of the Japanese, were active on both sides during the war. That torpedo-carrying vessels are essential to a well-rounded fleet was definitely established by the two wars.

For nine years after the Spanish-American War we continued on our destroyer program of the year 1898. From 1907 steady progress was made at the rate of about six destroyers a year until 1916. The war gave an impetus to our entire shipbuilding program, destroyers included, and in 1916 and 1917, prior to our entry into the war, 35 destroyers were authorized. On 1 July 1917, the year we declared war against Germany, we had 52 destroyers fit for service.

World War I was the testing ground of the destroyer. In actual tasks performed, Allied destroyers probably contributed as much as or more to the successful conclusion of that war than did any other type of ship. They made the convoy system possible and practicable. In 1917, after our entry into the war, this country engaged in the then vast program of building 238 destroyers.

After the war, as more and more of our destroyers came into service, it became increasingly difficult to keep them in commission. Peace, economy, and disarmament became the watchwords. Over 200 of these ships were laid up, some in the Philadelphia Naval Shipyard and the remainder at the Destroyer Base at San Diego, California.

In 1940, 72 destroyers of the *Bristol* type were authorized, and throughout World War II these ships were built in unprecedented numbers. The admirable performance of the *Fletcher* and *Sumner* classes during World War II insured these ships a permanent place in the modern Navy. Before the end of 1943, the United States built and had in operation probably more destroyers than were on the combined lists of the navies of the world only a few years prior to that time.

It is interesting to note that the outbreak of war in September of 1939 found Great Britain with only 185 destroyers in her Navy, whereas she had 500 available in the last stages of World War I. This weakness almost proved her undoing in 1940 and 1941, when her shipping losses were so terrific as to affect materially the course of the war.

DESTROYER ESCORTS (DE)

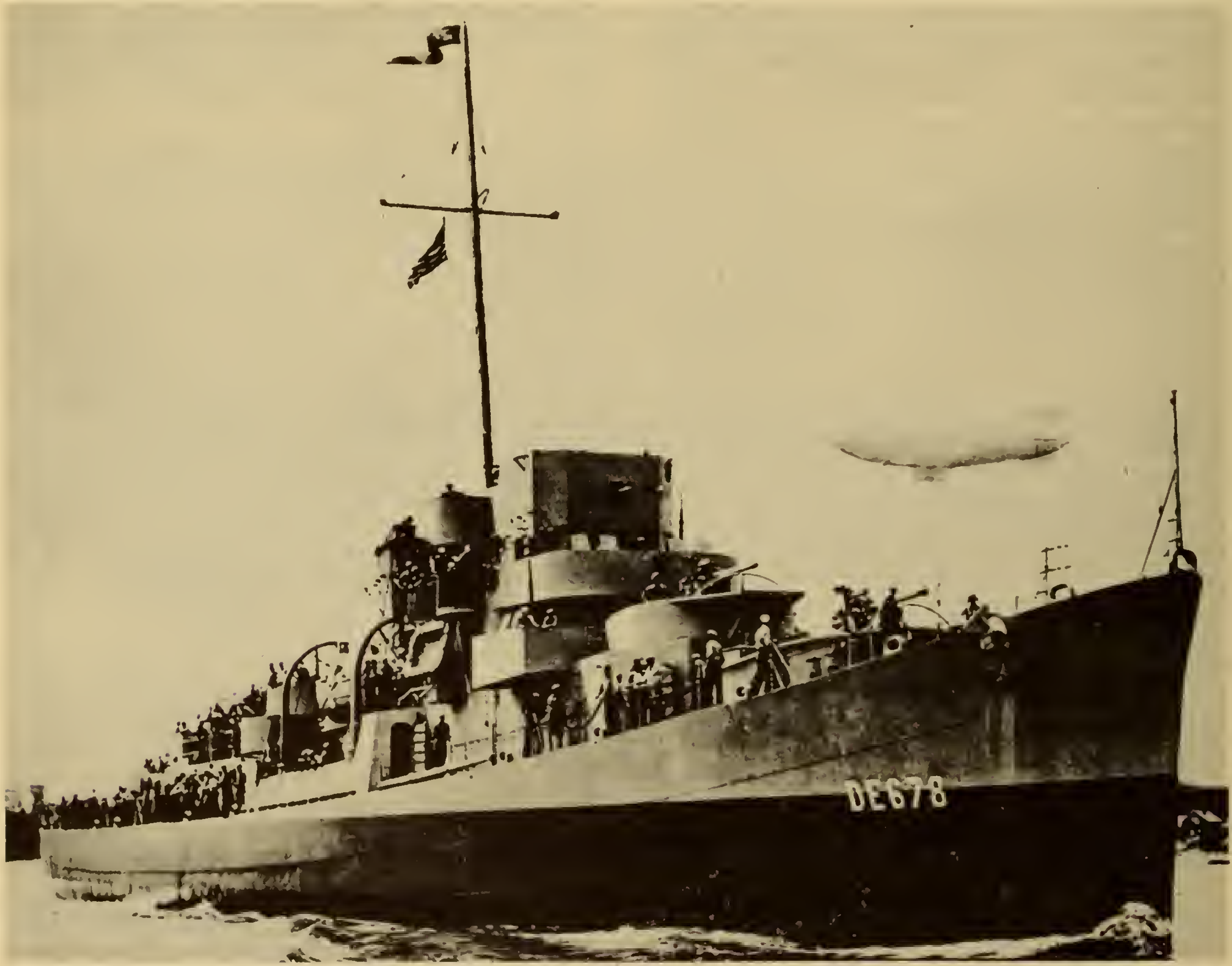
General Description

Destroyer escorts, one of the new types of vessels added to the United States Fleet during World War II, were intended primarily for use in antisubmarine warfare. They were used to escort convoys and also acted as plane guards for CVE's. Their record in the war against submarines was excellent. The DE can be built rapidly at comparatively low cost (about $5,000,000 as compared to $15,000,000, the average cost of a destroyer), and their operating expenses are considerably lower than the destroyer's, all of which makes them relatively expendable, a necessary characteristic of antisubmarine craft.

Destroyer escorts are smaller and slower than destroyers but are larger, faster, and more maneuverable than any ship previously designed specifically for use in antisubmarine warfare. They are equipped with the most modern developments in detection and ranging devices and are armed with depth charges, 3-inch or 5-inch guns, and numerous antiaircraft guns. They also carry hedgehogs which are launching devices for antisubmarine projectiles that go off only on contact. They are fired in pairs at short intervals so that 24 charges, forming a circular pattern, strike the water at the same time.

DE data

Standard displacement	1140-1450 tons
Over-all length	289+-306 feet
Extreme beam	35+-37 feet
Maximum navigational draft	11-13.75 feet
Trial speed	19-24 knots
Complement	About 200



USS *HARMON* (DE678)
The destroyer escort was built to fill the gap between the submarine chaser and the destroyer. USS *Harmon* saw duty in the North Atlantic as a convoy escort ship.

Background of the Destroyer Escort

When we commenced furnishing escort vessels for convoys prior to 7 December 1941, the only type we had available for such duty was the destroyer, actually a faster and more heavily armed vessel than was needed.

The demand for destroyers to act as escorts became stronger and stronger as our lend-lease convoys grew larger and more frequent. It was not at all unusual to find a paltry number of destroyers acting as escorts for a huge convoy consisting of dozens and dozens of fine, large ships.

In order to meet the growing menace to convoy operations due to our lack of available ships, particularly after 7 December and the Axis' great effort to cut our lifeline extending across the Atlantic, it was necessary to design and build ships to fill the gap between the submarine chaser and destroyer. The destroyer escort, our version of the British corvette, was designed, after due consideration of production and shipbuilding facilities, to serve this purpose.

POST-WAR DEVELOPMENTS

As a conclusion to this discussion of large combatant ships, the following summary of the Navy's postwar shipbuilding and conversion program is appropriate.

The Navy's postwar shipbuilding and conversion program is directed towards providing certain advanced prototypes in the minimum numbers necessary for service evaluation.

Wherever possible, the need for new types has been filled by converting existing ships. In certain cases where the design characteristics could not be economically attained by conversion, it has been necessary to undertake the construction of new ships.

In general, the prototypes developed by the Navy will incorporate improvements based upon the experience gained during the war. They will, at the same time, include many technological advances perfected since the war.

The development of prototype designs has proceeded in four major fields. It has been our objective, by construction or conversion, to provide: first, aircraft carriers capable of handling the fast, heavy, long-range naval planes developed and under development since the war; second, high-speed, deep-submergence submarines; third, antisubmarine vessels to combat these submarines; and, fourth, ships equipped for polar and picket service.

To accommodate the increased size and power of modern naval aircraft, the Navy will construct a 65,000-ton, flush-deck aircraft carrier, and convert two *Essex*-class carriers.

Designated CVA58, but as yet unnamed,* the 65,000-ton carrier will have an over-all length of 1,090 feet. Her waterline beam will be 130 feet, and her maximum fixed width will be 190 feet. With her elevators and other temporary structures in place, she will have a width of 255 feet. Her long, armored flight deck, free of any island structure to limit the wingspread of the planes she will carry, will be capable of handling planes up to 100,000 pounds.

Concurrent with the construction of this big carrier, the Navy will strengthen the flight decks and increase the catapult and elevator capacity of two 27,000-ton carriers, the USS *Essex* (CV19) and the USS *Wasp* (CV18). This conversion, ultimately planned for all of the *Essex* class carriers, will greatly extend the range and striking power of our fast carrier task forces.

Most of the remaining ships in the Navy's postwar shipbuilding and conversion program are designed to provide prototypes for the sub or antisub phase of undersea warfare. Our strategic position is unique in that we must pursue with equal vigor the perfection of tactics, weapons, and devices utilized in both phases of undersea warfare. In the event of emergency, we must be prepared to launch a submarine offensive and, at the same time, repel any submarine offensive directed towards our life lines.

The offensive aspect of submarine warfare involves the construction of six submarines and the conversion of four others for specialized service. The six new boats, though comparable in size to the fleet type submarine which served so well during the war, will be streamlined and capable of much higher submerged speeds than any of our present subs. For specialized service, we are converting two submarines to submarine transports, one to a cargo submarine, and one to a submarine oiler.

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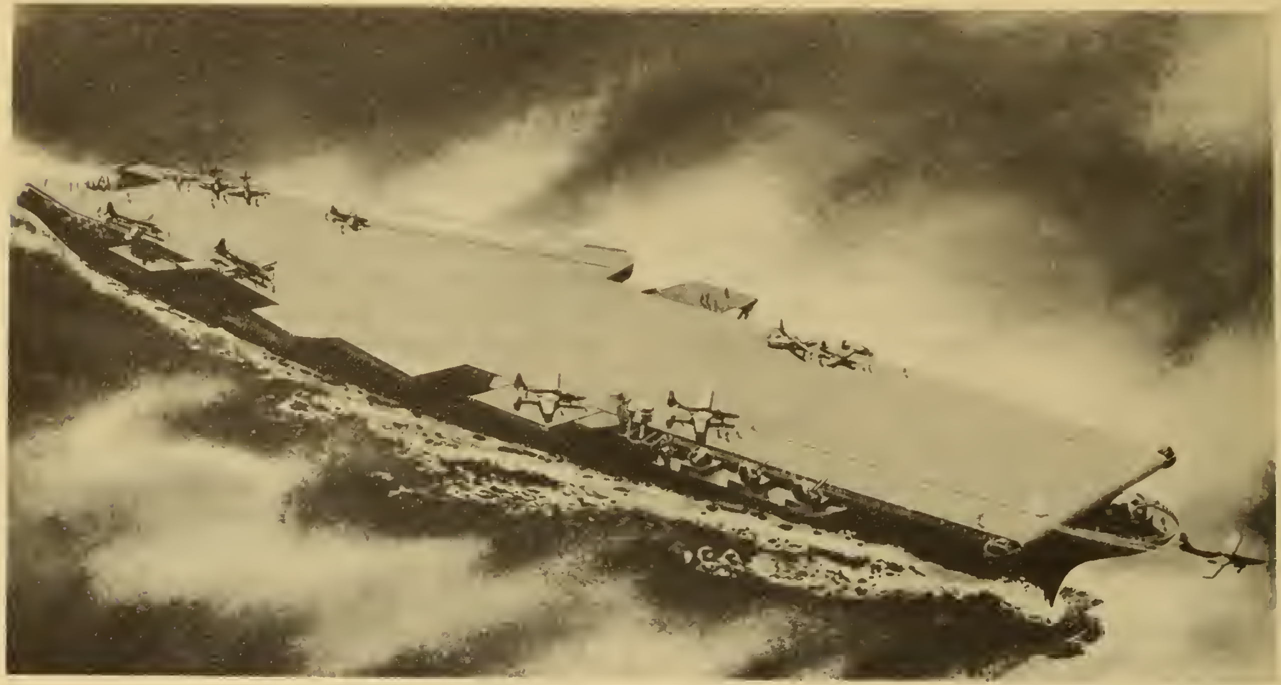
* The CVA58 has since been named USS *United States.*



ARTIST'S DRAWING OF USS *UNITED STATES* (CVA58)
This drawing represents the current plans for the 65,000-ton flush-deck carrier. When completed, the actual appearance of the ship may differ somewhat from this interpretation of the basic plans.

To combat the increased offensive power of the modern submarine, the Navy is constructing nine ships and converting twenty others.

The construction program includes two antisubmarine cruisers, four destroyers, and three antisubmarine submarines. As their name implies, the two antisubmarine cruisers will be large ships fitted with the latest weapons and devices for locating, tracking, and killing the high-speed submarine. The four destroyers, larger than their wartime 2,400-ton predecessors, will have a dual function. Essentially antisubmarine vessels, they will also have the speed, endurance, and seakeeping qualities which will permit them to serve with the fast carrier task forces. The three antisubmarine submarines will be smaller than any subs built in recent years, but fully equipped to do battle with other submarines on or beneath the surface.

The 20-ship antisubmarine conversion program includes two light carriers, twelve 2,100-ton *Allen M. Sumner* class destroyers. The two light carriers, the USS *Cabot* (CVL28) and the USS *Bataan* (CVL29) will, because of their greater size and speed, be able to wage more efficient warfare against the modern submarine than the slower, smaller escort carriers which broke the U-boat offensive in World War II. Similarly, by converting the twelve 2,100-ton destroyers to hunter-killer destroyers, we will be able to utilize the speed and seakeeping qualities of these larger ships for the functions performed during World War II by destroyer escorts and frigates. In antisub warfare, the emphasis of necessity must be on high-speed escort vessels lest the quarry outrun the pursuer.

The remaining seven ships in the Navy's postwar conversion program will emphasize changes necessary for polar or picket service. Two destroyer escorts and two submarines will be specially fitted for offshore aircraft detection. One cargo ship and two landing ships, dock (LSD's) will be converted for service in polar waters.

In allocating this new ship construction and conversion work, the Navy gave careful consideration to a problem directly affecting our national security. During the war, private shipbuilding plants built about 63 percent of the combatant ship tonnage, as well as virtually all of the auxiliaries and landing craft. Since the war, there has not been a sufficient backlog of work in the private shipyards to occupy their essential design personnel and maintain their vital shipbuilding skills. The naval shipyards, on the other hand, have been kept busy with a continuing program of ship repair and overhaul.

With these facts in mind, every attempt was made to allocate the construction and conversion of these ships so as to balance the impact of this program upon the design staffs of both the private and the naval shipyards. Thus, both will be ready to serve the nation in the event of another emergency.

CHAPTER 14

TYPES AND CHARACTERISTICS OF NAVAL VESSELS

Part II—Specialized and Small Combatant Vessels

SPECIALIZED COMBATANT VESSELS

Submarine (SS)

Although submarines have been a part of the Navy since 1901 when the "Holland No. 9" was purchased, it was not until World War II that this arm of the service demonstrated its versatility and effectiveness. (See Chapter 19 for details.)

Some older types, such as the R, S, and B classes, were in commission during the war, but by late 1942 they had been assigned to training duty only. The brunt of the undersea campaign was carried by the fleet-type submarine. Construction of these vessels, the result of extensive experiment and years of development, began in 1939. With some modifications and improvements dictated by combat experience, production of similar ships continued throughout the war. Hull thickness was increased beginning with the *Balao* (SS285) to permit operation at greater depths.

General characteristics of a typical fleet submarine are as follows:

Displacement (Standard)	1525 tons
Length (over-all)	311′ 9″
Mean draft (surface)	15′ 3″
Breadth (extreme)	27′ 4″
Diameter of pressure hull (max.)	16′ 0$\frac{3}{8}$″
Speed (approximate)	20 knots (surface) 10 knots (submerged)
Cruising range	12,000 miles (economical speeds)
Propulsion (surface)	Diesel-electric (4 1600-hp diesel engines and 4 1100-kw generators)
Propulsion (submerged)	Batteries driving main electric motors
Complement	7 officers, 70 men
Armament (torpedo)	10 torpedo tubes (6 bow, 4 stern) 24 torpedoes
Armament (gun) *	1 or 2 5-inch 25-cal. s.p. deck gun 1 40-mm Bofors AA gun 1 20-mm Oerlikon AA gun Small arms as appropriate

At present there are about 80 fleet submarines in active service, equally divided between the Atlantic and Pacific Fleets. In addition, about one hundred are laid up in the Reserve Fleets. Those in active service are conducting an extensive program of training and development of new tactics, as part of the over-all plans of the Chief of Naval Operations. A highly important part of their operations is the service rendered to our antisubmarine forces which are assisting in the development of new devices for combating high-speed, deep-diving, snorkel-equipped submarines.

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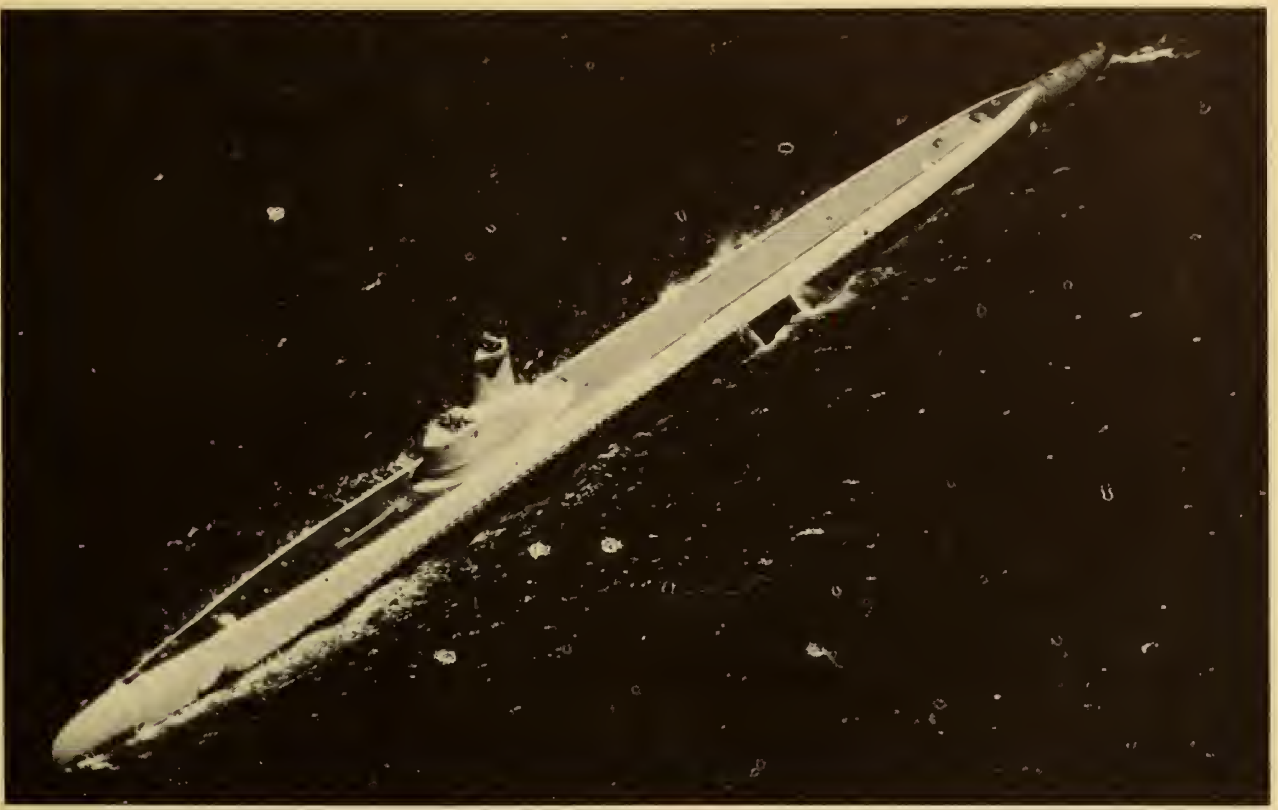
* Gun armament was modified according to assigned mission.



USS *POMODON* (SS486)

USS *Pomodon* is a fleet-type submarine. As shown here, she has been altered to include some of the improvements based on lessons learned in World War II. The streamlined superstructure greatly increases underwater speed.

As mentioned in the preceding chapter, an extensive program of modification and new design is now underway. A number of fleet submarines are being altered under the "Guppy" program to attain increased speed. Their superstructures are being cut down and streamlined, guns and other topside equipment are being removed or recessed, batteries are being doubled in capacity, and they are being equipped with the snorkel. The snorkel, developed from a Dutch device by the Germans, is a telescopic piping device which admits air for the engines while submerged at periscope depth. It will allow battery charging without surfacing, and will make the submarine much less vulnerable to detection.

The conversion program includes alterations to certain other fleet submarines for special missions. They include: troop carrier (SSP), cargo carrier (SSA), polar picket (SSR), and oiler (SSO). One submarine has been redesignated as a guided-missile submarine (SSG), and is being used for experimental purposes in this field.

New construction plans call for six high-speed, attack type submarines on which no details are as yet available. In addition, three smaller submarines of a new type (SSK), whose primary mission will be antisubmarine warfare, will be built.

Improved speed and range characteristics, new methods of propulsion, and new tactical concepts combine to make the Navy's submarine arm a factor of increasing importance in naval warfare of the future.

Landing Vessels

One of the most sensational developments in modern ship construction was the assortment of landing vessels that appeared early in World War II and proved their worth throughout the war's duration.

Their purpose is to guarantee the landing of a sufficient flow of men, supplies, and equipment to establish a beachhead and carry the fight inland. Such a boat must have reasonable speed and endurance. It must be capable of running through surf, of beaching without damage to itself, and of retracting and returning through the surf.

The conventional type of boat is not at all suited to such service. It cannot successfully be beached and retracted through surf. It grounds in about three feet of water. It is hard to climb out of under such conditions, and men so leaving it would have to drop into more than three feet of water.

It is difficult to list many characteristics of the class as a whole because of the wide range of types. In general, it may be said that landing vessels have a ramp at the bow and light protective armor on the conning tower. Watertight subdivision is practically nonexistent and all, except the LSD, are propelled by diesel engines. When about 200 yards from the beach, many of these vessels drop a stern anchor to avoid broaching and to facilitate retracting from the beach. Their draft is comparatively shallow, and their underwater design permits rapid beaching and retracting.

A somewhat arbitrary distinction between landing ships and landing craft may be made on the basis of length, those under 200 feet being classed as *landing craft* and those over that length being termed *landing ships.* Larger landing craft and all landing ships are ocean-going vessels, although their speed is relatively slow.

Landing Ship, Tank. The principal function of the landing ship, tank (LST) is to establish a beachhead and land vehicles, often in the face of strong enemy opposition.

Early in World War II, it appeared that tanks would be the largest and heaviest vehicles to be handled on the beaches. Tanks therefore became the measure of the carrying capacity of the craft being designed, even though the bulk of the vehicles they might be called upon to land included everything else but tanks.

As happened in so many other instances in World War II, the LST was employed for many tasks in addition to that for which it was built.

During the invasion of Normandy, all LST's were equipped for casualty evacuation, with facilities for about 200 patients. To each there were assigned two

USS ODAX (SS484)

The Odax, another streamlined submarine in the post-war "Guppy" program. Snorkel, a device developed by the Germans, is one of the innovations that we have improved and adapted for use on United States submersibles. It enables the submarine to run at periscope depth on its diesels, thus increasing the time that it can run submerged.

Navy medical officers, one Army traumatic surgeon, two Army enlisted surgical technicians, and several Navy hospital corpsmen. After discharging their original cargo, these ships were able to evacuate large numbers of wounded. At Normandy, early estimates were that evacuation from the beaches would not be possible until H-hour plus 2. Six hours later, casualty evacuation points were established and the flow of wounded men to England was begun.

The LST was used successfully for transporting all types of vehicles, for carrying high explosives, and for moving large quantities of aviation and motor gasoline. Transporting dangerous cargo exposed the LST to unforeseen operating hazards but these vessels demonstrated a real ability to withstand the effects of severe damage while engaged in any one of a variety of amphibious operations.

Tanks, other vehicles, or general cargo are carried in a hold 260 feet long, on either side and outboard of which are compartments where troop passengers are quartered. Cargo is also carried on the main deck as well as in the hold. Most LST's mount only 40-mm guns and are diesel driven. Their endurance is considerable in terms of fuel and supplies.

LST data

Beaching displacement	2,366 tons
Full-load displacement	4,080 tons
Over-all length	328 feet
Extreme beam	50 feet
Maximum navigational draft	14+ feet
Trial speed	11.6 knots
Shaft horsepower	1,700
Troop capacity	175 approx.
Complement	120 approx.

Two post-war LST's are considerably longer than those described above which were constructed and used during World War II. An additional 54 feet of length permits roomier accommodations for crew and troops and more space for carrying tanks, trucks, and cargo. The post-war LST's are speedier, too, being steam propelled. Two 5″/38 dual-purpose guns give added firepower, and shallower draft at the bow facilitates beaching. Cargo booms are installed, and the vessel carries four landing craft.

ROCKET-FIRING LANDING CRAFT
The LCI (landing craft, infantry) was designed primarily to carry troops in amphibious landings but here we see one of these vessels laying down a powerful barrage to smother beach defenses.

Post-war LST data

Beaching displacement	3,010 tons
Full-load displacement	6,000 tons
Over-all length	382 feet
Extreme beam	54 feet
Maximum navigational draft	14+ feet
Trial speed	14 knots
Shaft horsepower	6,000
Troop capacity	197
Complement	190

Landing Craft, Infantry (Large). Landing craft, infantry (large), the LCI(L)'s, were designed primarily to carry troops.

After the initial waves of troops have been landed in the smaller boats and have secured a foothold in the beachhead, the problem of deployment of troops at the waterline is not so acute. It is then economical to land them in larger groups. For this purpose, a larger beaching craft capable of carrying a considerable number of troops for longer intervals of time is needed, and the answer is produced in the LCI(L).

These are actually long-range, ocean-going craft capable of crossing the seas themselves although they do not have facilities for carrying their capacity of troops for more than a few days. They can be beached and retracted in the same general manner as the smaller craft. They have a speed of about 14 knots and their armament consists of four or five 20-mm close-in antiaircraft guns.

The LCI(L) is usually loaded only about a 48-hour trip from its destination due to its limited galley and living accommodations. It can carry almost 200 troops fully equipped for an assault landing. These craft were originally designed with a ramp on either side of the bow for debarkation but the later models were built with a center ramp. After beaching or loading, the LCI(L) can retract from the beach under its own power, being equipped with a stern anchor. Packaged cargo which does not require equipment for handling can be transported in these ships.

LCI(L) data

Full-load displacement	387 tons
Over-all length	159 feet
Extreme beam	23+ feet
Maximum navigational draft	5.67 feet
Shaft horsepower	2,320
Trial speed	14.4 knots
Troop capacity	192 approx.
Complement	25 approx.

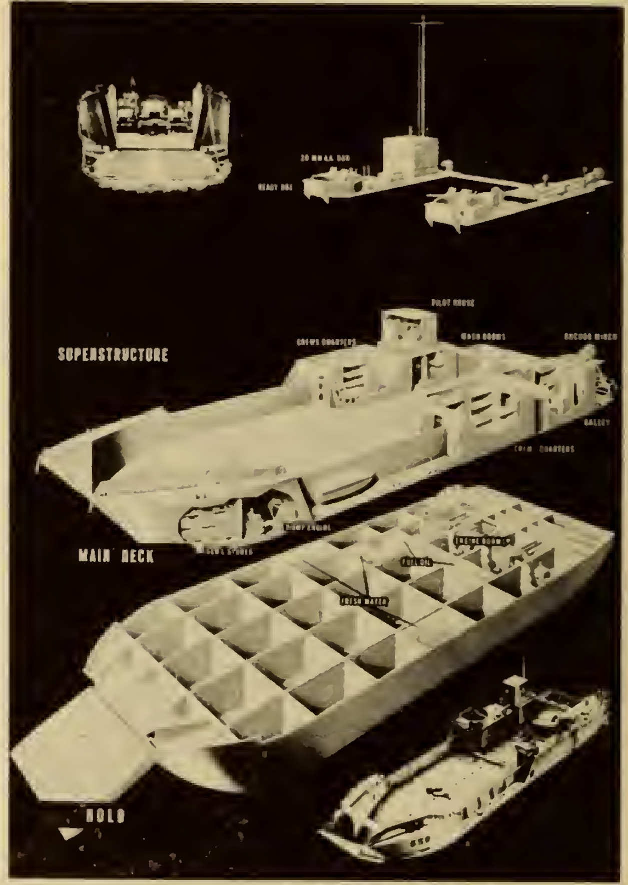
Landing Craft, Tank. Designed to land Army tanks under their own power, the LCT, or landing craft, tank, is of two types. During World War II, about 500 of these craft were built to transport the Mark V tank, and about twice that number to accommodate the Mark VI tank. These were known as the LCT(5) and the LCT(6) respectively. They carry about six tanks.

These craft are open decked and have the general appearance of a barge. They are not ocean going and are generally transported on LST's or in sections on transports (AKA's or APA's). Occasionally they are used on runs from nearby bases or for ship-to-shore transportation. They are also employed to carry other motorized vehicles and artillery as well as tanks. They have no troop accommodations.

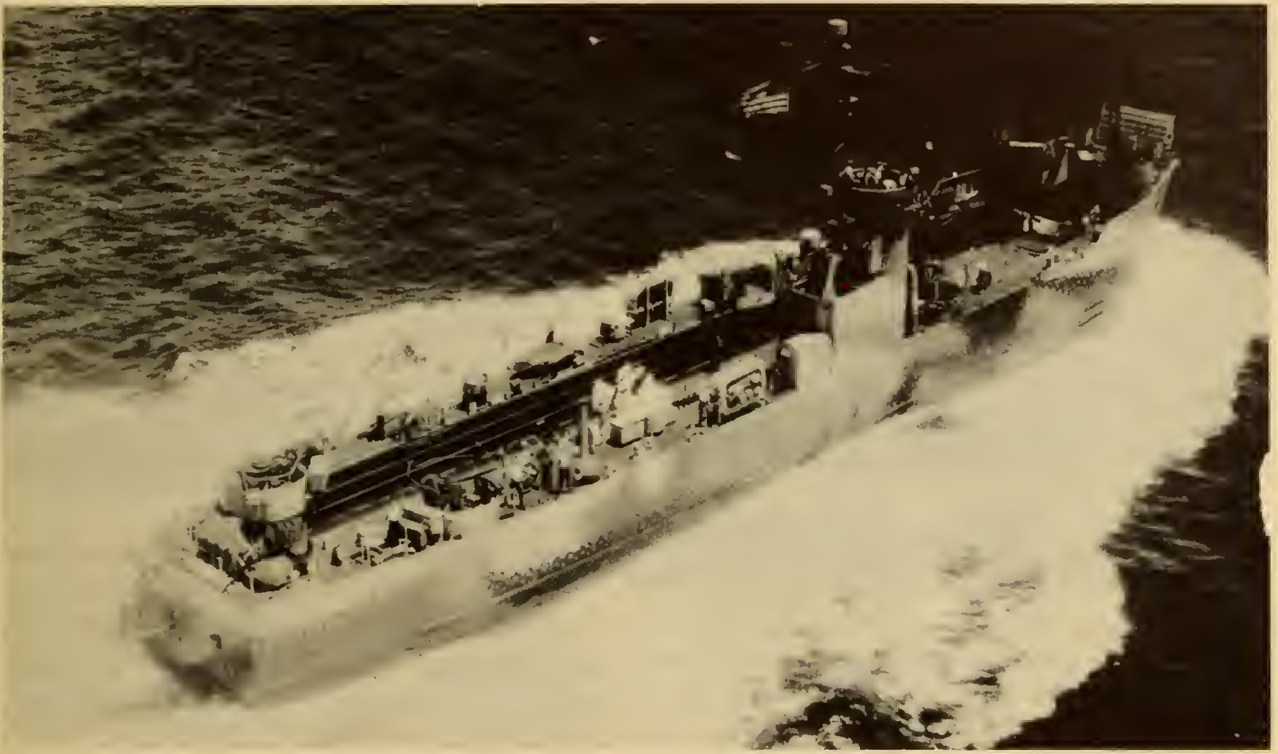
LCT(6) data

Full-load displacement	309 tons approx.
Over-all length	119 feet
Extreme beam	32.67 feet
Trial speed	10 knots
Maximum navigational draft	3.75 feet
Shaft horsepower	675
Complement	12 approx.

Landing Ship, Medium. The landing ship, medium (LSM), is designed to land a combat load on the beach and to supply the beach after the original landing. The over-all length is slightly more than 200 feet, and the cruising radius is well over 3,000 miles; the



LANDING CRAFT, TANK
These diagrammatic views of the LCT show the inner structure of these sturdy craft. Tanks and other types of vehicles may be carried by the LCT's.



LSM—LANDING SHIP, MEDIUM
The LSM, produced in the later months of World War II, has size, speed, maneuverability, and armament.

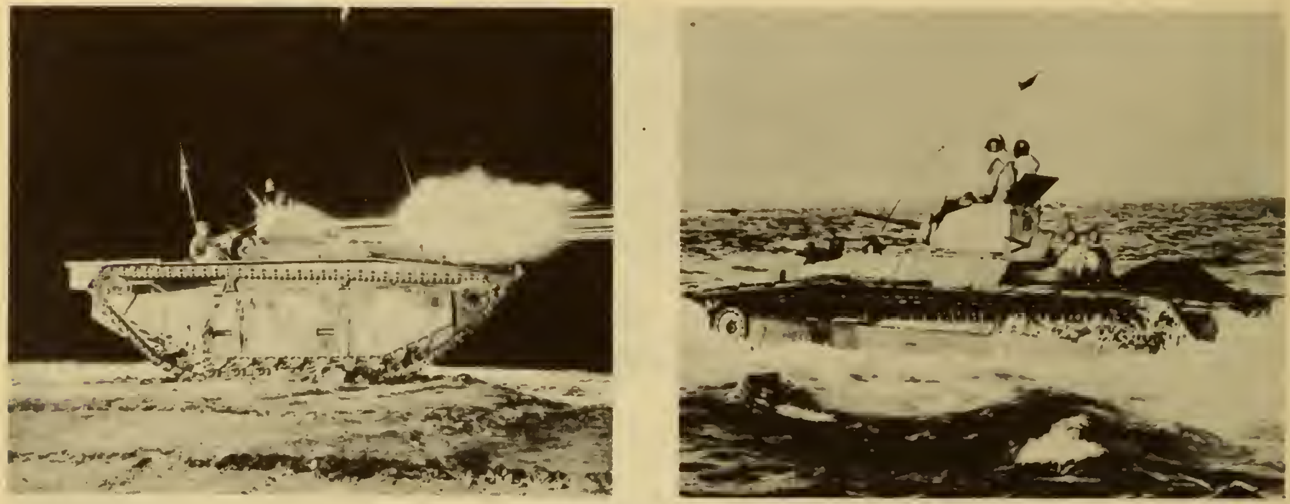
armament consists of one 40-mm antiaircraft gun. The ship's complement is 4 officers and 48 men, and the commanding officer usually has the rank of lieutenant. The LSM, which has the same capacity as the LCT, was developed later than the LST to operate with LCI(L)'s. It is an ocean-going type of considerable endurance.

A number of LSM's have been redesignated LSM(R) and are equipped with rocket launchers varying in number from 10 to 105. In addition the LSM(R) carries a 5"/38 dual-purpose gun and four 4.2 mortars.

Landing Ship, Dock. The landing ship, dock (LSD), more than 450 feet in length, is the largest landing ship. Actually it is a ship built around a floating drydock, and it carries loaded landing craft into the beachhead area. The hold is then flooded and the craft sail out. The LSD has a massive forecastle which, combined with a low stern, gives it a topheavy, unbalanced look. Insignificant stacks rise amidships from each bulwark. The open hold aft may be decked-over temporarily to carry more cargo. It is well armed for antiaircraft defense and may function as a repair ship after the beachhead has been established.

Some of the LSD's were originally laid down as APM's (mechanized-artillery ships) and converted for use in World War II as landing craft. Their full-load displacement is over 9,000 tons and, equipped with turbine engines, they can attain a speed of more than 15 knots. They are capable of accommodating a crew of about 325 officers and men. As armament, they usually carry one 5"/38 dual-purpose gun and two twin and two quadruple 40-mm antiaircraft guns.

Landing Vehicle, Tracked. The landing vehicle, tracked (LVT), is used both as a cargo and as a personnel carrier. The blades on the tracks make this vehicle very effective in landing operations involving reefs and swamps. The two main types are the LVT(A)(1), an armored amphibious cargo and personnel carrier mounting two machine guns; and the LVT(A)(2), an armored amphibious tank, with low lines and a turret superstructure, mounting a 37-mm



AMPHIBIOUS TANK—LVT(A)-1
The amphibious tank is a versatile vehicle, and travels easily on land and sea. It is armored and well armed, boasting a 37-mm cannon and two .50-caliber machine guns.

cannon. A gunboat on the water, it becomes a tank when it hits the beach. At Tarawa these craft swept over reefs, on to the shore, and on the island when other landing craft had difficulty.

Landing Craft, Support, Small. The LCS(S) is designed to furnish fire support, both surface and antiaircraft, in the area of the landing. It is sometimes used also as a command craft for troop commanders. It is about 36 feet in length, and has rocket and gun installations. Smoke generators are also provided. The personnel consists of an ensign and a crew of six men. These boats ordinarily do not come closer to shore than 800 yards.

Some other types of landing craft are: LCVP (Landing Craft, Vehicle, Personnel); LCR (Landing Craft, Rubber); LCM (Landing Craft, Mechanized); LSV (Landing Ship, Vehicle).

MINE VESSELS AND PATROL VESSELS

Mine Vessels

The mine vessels in use in the United States Navy include a great variety of ships ranging from specially designed 6000-ton vessels to small, specially designed boats. Basically, they consist of two types, minelayers and minesweepers. The former are used primarily to sow defensive mine fields. Minelayers usually plant the mines in fields which may be used to block channels, protect harbors, harass trade routes, and embarrass the enemy during fleet actions. Mines may be laid from the decks of minelayers and some minesweepers, from PT boats, from torpedo or bomb racks of planes, and from torpedo tubes or special release chambers of submarines.

Minesweepers are in constant use in wartime to clear areas in which mines are known to be or suspected to have been planted. Along our own coastline they keep regular channels open and safe for our shipping and, in more distant theaters of operation, clear the way for landing craft or sweep captured enemy harbors before transports and supply ships make use of them. Minecraft which operate with the fleet or in hazardous advanced areas must be seaworthy and capable of self-defense. Most of our minecraft are especially designed for this type of operation. Others are converted destroyers with torpedo tubes removed and minelaying racks or sweeping gear installed. For defensive operations along our coastlines, small wooden ships and fishing vessels are satisfactory.

The principal types of minecraft are:

CM: large ships designed for fleet minelaying

CMc: coastal minelayers, usually converted from small, merchant ships

DM: light minelayers converted from 2200-ton destroyers

DMS: high-speed minesweepers converted from 1,630-ton destroyers

AM: specially designed fleet minesweepers

AMS: wooden-hulled minesweepers, especially useful in restricted waters

Patrol Vessels

Patrol vessels were built in large numbers during World War II to replace the larger, more valuable DD's and DE's operating as antisubmarine vessels in and around harbors and restricted waters. When in operation they usually have available sources of protection in addition to their own. These might include shore batteries, minefields, aircraft, and in an emergency, heavier surface ships.

Motor torpedo boat (*PT*). The motor torpedo boat is essentially a fighting craft whose outstanding characteristics are speed, maneuverability, and armament. PT's are highly vulnerable because of their type construction and lack of armor protection. Their primary armament consists of 40-mm guns and torpedoes. No torpedo tubes are carried, but short, aviation-type torpedoes are launched from racks after their exploder controls have been set. The PT's cruising range at high speed is quite limited, being about 300 miles maximum. At cruising speeds, however, its endurance is considerably increased. Propulsion is supplied by high-powered gasoline engines.

MOTOR TORPEDO BOAT
The speedy, well-armed PT boat is a formidable croft for its size.

PATROL CRAFT
PC's are used in submarine detection. They are well armed and are useful in harbor protection.

Because of their lack of protective armor, motor torpedo boats employ hit-and-run tactics in attack. Concealment is essential and for this reason the PT usually attacks at night, or under conditions of poor visibility in the daytime. It carries equipment for laying a smoke screen and attacks at low speed to lessen engine noise.

The primary mission of the motor torpedo boat is to attack large vessels with torpedoes and to patrol coastal areas. During World War II, it proved itself an extremely versatile craft and performed effectively in such roles as rescue vessel, antisubmarine craft, minelayer, transport for small groups, and gunboat.

PC and PCE. Because entrances to harbors, that is, points where ship traffic is heavy, are usually chosen by the enemy for submarine attack, many antisubmarine vessels are relatively small craft whose primary functions are patrol and coastal convoy.

The PC is about 175 feet long and is steel hulled.

Diesel propelled, its shaft horsepower is about 3,000, and it is capable of a speed of about 18 knots. It is usually armed with one 3″/50 dual-purpose gun and a 40-mm antiaircraft gun. The crew numbers 65, of whom 4 are officers.

The PC's were turned out in large numbers during World War II and they frequently teamed up with aircraft both in antisubmarine and rescue operations. They carry a considerable amount of detection and ranging gear that is useful in locating submarines. They also carry specialized antisubmarine weapons and are highly maneuverable. Because they usually operate not too far from aircraft or heavier ships and are, in addition, well armed, these craft are directly and indirectly a potential source of heavy damage to submarines.

The PCE is 180 feet long but its tonnage is over twice that of a PC. Its horsepower is about 1,800 and it is capable of a speed of 15 knots. Its armament consists of a 3″/50 and three twin 40-mm antiaircraft guns. Although the PCE is designed mainly for escort work, many of these vessels have been converted for use as weather station and patrol ships. Its crew consists of 90 men and 5 officers.

CHAPTER 15

TYPES AND CHARACTERISTICS OF NAVAL VESSELS

Part III—Auxiliary Ships

INTRODUCTION

The Train

The noncombatant auxiliary ships of the fleet are referred to as the train or the service forces. There is a wide range of size and shape in the train and many of the cargo ships and transports may be recognized as modifications and conversions of major type designs that are the backbone of the merchant fleet. During World War II, unlike the task forces which they serviced, the auxiliaries seldom figured in headline news. But it was in no small measure due to the services they performed for the fleet that the task force was able to establish its reputation as one of the most formidable instruments of modern naval warfare. In one instance a task force protected Guadalcanal for almost two months without touching land. The usual method is for the ships of the task force to meet the train for refueling and repair at some prearranged rendezvous after the strike.

From the first it was obvious that in the conduct of the war in the Pacific one of the factors that would consistently operate against us was distance — distance from sources of production and distance from bases of supply and repair. The service ships helped to lessen this disadvantage by furnishing supplies and carrying out various maintenance functions for ships operating many miles from their bases. Japan had believed that she was secure from our attacks as long as she was in possession of the land bases within striking distance of the homeland. Even the advent of the task force failed at first to lessen that feeling of security, for the Japanese militarists assumed that ships of such a force would have to return to their bases for fuel and repairs after each strike. But in this they were wrong, for the naval tankers provided a line of filling stations that, reversing the usual procedure ashore, drove up to the customer. Before the war ended, it was apparent that the services provided by the auxiliaries to the ships at sea made the fleet's striking range practically limitless.

Service Forces

The auxiliary ships of the fleet are assigned to Service Forces Atlantic (ComServLant) and Service Forces Pacific (ComServPac); to the Amphibious Forces (AGC, APA, AKA, APD); to the Mine Forces (AM, AMC, AMS); to the Air Service Forces (AV, AVP, ARV, AVD, AVC, AVS); to the Naval Transportation Service (APA, AD, AKA).

There are three phases to the services of supply:

First phase is the stocking of bases along the coasts and outside the continental limits. Service force staffs ashore compile requirements, set delivery intervals, and see to it that the materials are procured and delivered on time wherever needed. During the conduct of a war, care must be taken to insure that delivery of high-priority items is not interfered with by transfer of less essential goods.

The next phase is supplying of fuel, aviation and motor gasoline, fuel and diesel oils, and lubricants. Some of the oil is procured from as far away as the Persian Gulf and delivered to major bases in the

United States or overseas. Petroleum distribution is a giant undertaking that coordinates the movements of Navy and Navy-chartered tankers so that the oil is delivered wherever the Navy needs it. Some idea of the extent of this task during wartime may be gained from the fact that during one period of World War II at Guam alone nearly one million gallons of aviation gasoline were used daily.

Finally, the fleet's needs are supplied by the auxiliaries. Food and equipment must be delivered in proper condition wherever and whenever needed. The efficiency with which such work was performed during World War II gave to fleet supply the status of a weapon of war, almost that of a secret weapon in fact. In wartime the task becomes a much greater one—the volume of supplies is increased and there are more varieties. Also, there is always the possibility that the ships of the auxiliary fleet may have to take part in combat operations. For this reason, frequent gunnery drill is engaged in by the members of the crew.

But in addition to the services of supply mentioned above, many other duties are assigned to the service ships. They not only supply goods, they deliver personnel; they perform towing and salvage services for the fleet; they distribute mail; they transport the sick and wounded; and they repair and help to maintain the ships of the fleet—including those of the auxiliary forces—in operable condition.

CARGO AND TRANSPORT VESSELS

Cargo Vessels

Cargo vessels are of various types. In addition to those described here, which are the typical cargo ships (AK) and the attack cargo ship (AKA), there are also the AKN or net cargo ship, the AKS or general stores issue ship, and the AKV which is a cargo ship and aircraft ferry.

AK and AKA. Many of the Navy's cargo ships were originally laid down as merchant ships. Some have already seen service with the merchant fleet; others were converted, either before or after completion, for Navy use during the war.

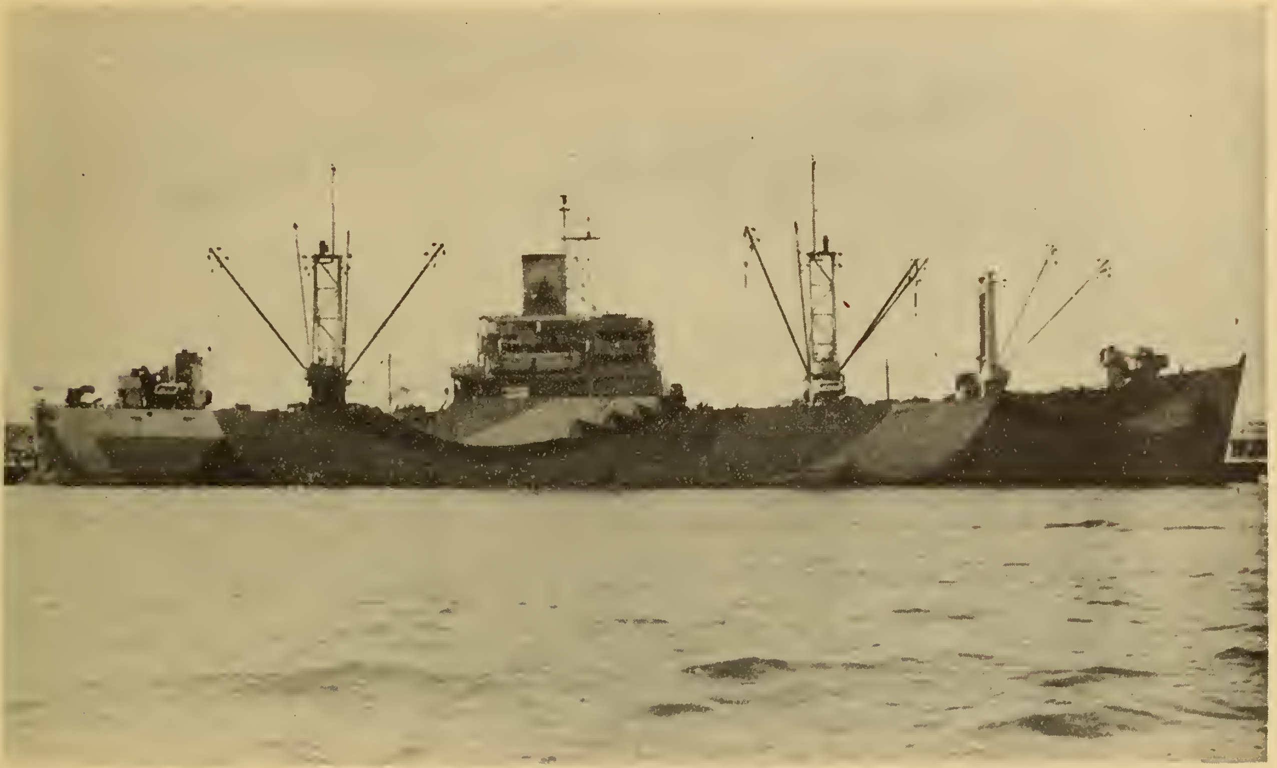
The approximate range in over-all length is from 338 feet to 441 feet for the AK's, or cargo ships. The AKA's, or attack cargo ships, average 450 feet. The speed of the AK ranges from 11 to 15 knots; all of the AKA's are capable of something over 16 knots. The AK's usually mount a 5"/38 or a 3"/50 and may have two or four 40-mm singles; the AKA's carry considerably more antiaircraft guns.

In cargo capacity, the range of both ships varies to a great extent. It is difficult to give typical figures. Average figures for the AK would be approximately 250,000 cubic feet of space for nonrefrigerated goods and 9,830 cubic feet for refrigerated goods. On the AKA such space is somewhat greater. Both the AK's and the AKA's have refrigerating facilities.

The AKA is a development of World War II. In appearance it is very much like the conventional AK, the typical naval cargo vessel. The attack cargo ship, however, is the only ship equipped to carry large quantities of attack cargo, combat loaded, at high speed. The process of combat loading makes it necessary to sacrifice some of the cargo space but it assures that the materials—about 2,000 tons—will be unloaded in the order in which it is anticipated they will be needed. It also assures greater speed in unloading, for there is no necessity of hunting around for a particular item, or of performing multiple moving operations or sorting.

These ships carry landing craft, LCM's and LCVP's, and there is ample room aboard for boat crews in addition to the normal crew. Entire number of personnel aboard is about 480, of whom more than 100 are boat crews.

Much conversion was necessary to transform a merchant fleet C-2 hull into an attack cargo ship. Special cargo booms had to be installed for putting the landing craft into the water; special fire mains and fire-fighting equipment had to be added, as well as more radio and radar gear. Additional berthing and messing facilities were installed and special ventilation equipment was necessary. It is remarkable, considering how often these ships were in the forefront of amphibious attacks in the past war, that not one of the 108 that the Navy had in operation was sunk. When attacked, they were often afforded protection by the capital ships that they accompanied, but just

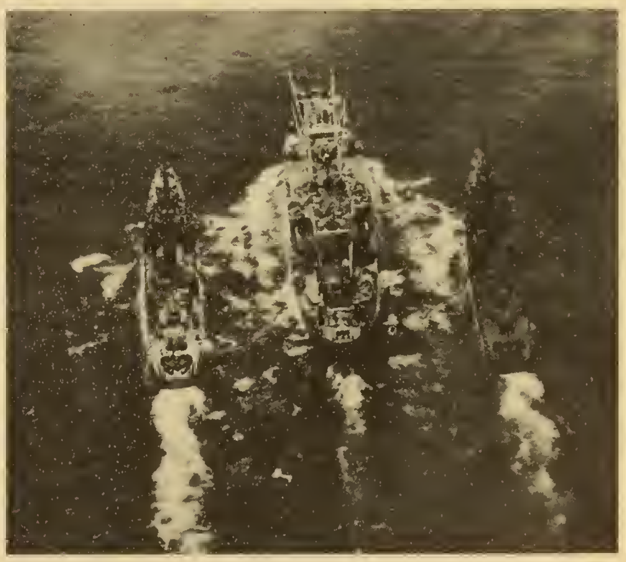


USS *WYANDOTTE* (AKA92)
Although classified by type as an auxiliary, the AKA is operationally an amphibious vessel. The large amount of armament puts these ships in the combatant class.

as often their own guns and their crews' skill in using them were sufficient to beat off the attackers. When general quarters was sounded over an anchorage, the AKA got into the fight along with the other combatant ships. The cargo ships were a primary target, for the enemy realized that troops on the beach could not operate without supplies.

Although the AKA is discussed here as an auxiliary, it is operationally an amphibious ship.

AKN. A recent development in the fleet is the AKN, the net cargo ship, which hauls the nets for submarine and torpedo protection to the area where the AN (net-laying ship) is equipped to set it up. The AKN's are converted from Liberty ships. Of 10,658 tons, 441 feet in length, AKN's have taken over the work of other vessels which were substituting. With bases established far from American shores, it became increasingly necessary to provide submarine and torpedo protection in forward areas.



ANOTHER TIME SAVER
A provision ship transfers supplies to two destroyers, saving them a long trip to a land base for supplies.

AMERICA
UNITED STATES LINES

SS *AMERICA*—LUXURY LINER
One of the finest passenger ships afloat, the *America* was converted early in the war and became the troop transport USS *West Point.*

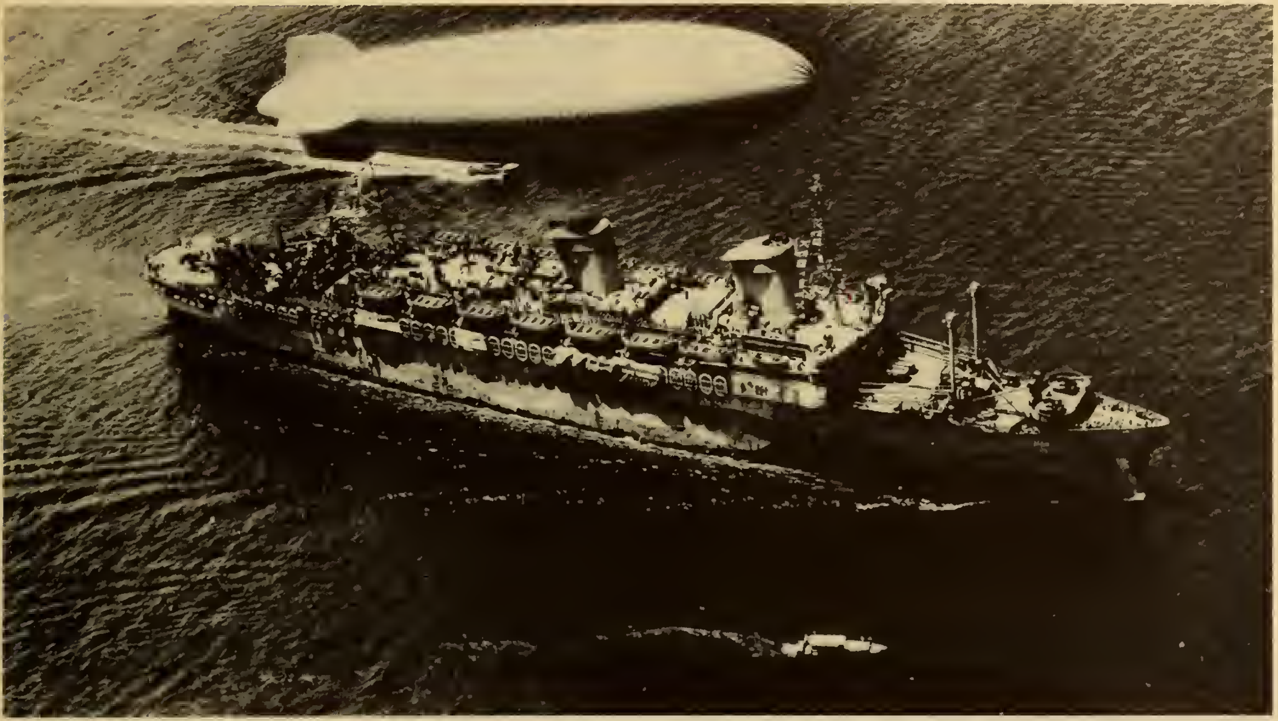
Transport Vessels

Like the AKA, the attack transport (APA) is a development of World War II. Other types of transports that appeared for the first time in that war are the barracks ships (APB and APL) and the transports for the evacuation of the wounded (APH). Many high-speed transports (APD's) that were in use during the war were converted destroyers and destroyer escorts. These are all modifications to a certain extent of the standard Navy transport (AP).

The barracks ship is actually a floating hotel. It carries a crew of about 140 but has accommodations for from 300 to 1,200 additional personnel. One type, the APB, is self-propelled but the APL is not. These ships furnish food, housing, and fresh water for the crews of repair ships. In normal circumstances such a ship is not necessary since regular berthing spaces are provided for the crew. But in wartime with much of the machinery in use 24 hours a day and with extra personnel assigned to fill this schedule, it was necessary to provide living facilities outside the ship.

The transports for the evacuation of the wounded, the APH's, provide treatment for urgent cases while speeding them to locations where greater hospital facilities are available. The primary purpose is transport and these ships do not have so wide a variety of medical equipment as the hospital ship (AH). Medical Corps personnel assigned are competent to perform any services that might be essential to a man who is wounded or seriously ill, and the operating rooms of these ships have been equipped to care for any emergency. The wards can accommodate about 1,200 patients; in addition, the ship carries a crew of 450. Their speed is about 18 knots and their overall length is 450 feet.

AP and APA. One of the best known of the naval transports during the past war was the AP23, the USS *West Point*, which is now, as it was before the war, the luxury liner, SS *America*. Converting such a vessel to a wartime troopship was an undertaking of major proportions. Reference to the illustration of this ship reveals one major change—the addition of numerous life floats. But within, the *America* underwent greater modifications. Cocktail lounges and ballrooms



USS *WEST POINT*—TROOP TRANSPORT
The *West Point*, shown above, bears little resemblance to the luxury liner *America*. Not only her exterior, but also her interior fittings were changed to suit her to her new mission.

have no place on a troopship. Floors do not have to be carpeted nor is there any need for daintily decorated suites. Spacious dining rooms are needed but the number of "guests" that must be accommodated is multiplied many times. (The troop capacity of USS *West Point* was about 7,600 and the crew numbered almost 1,000.) The men who made the trip in the *West Point* traveled in comfortable but not luxurious quarters. It may have provided some comfort to them to know that the provisions made for their safety were greater than the *America's* passengers could have secured at any price.

Another liner, SS *Manhattan*, as the USS *Wakefield* (AP21), was also used by the Navy as a troopship. Not quite so large as the *West Point*, the *Wakefield* was a faster ship, having a designed speed of 21.5 knots as compared to the *West Point's* 17.5 knots. Troop capacity was about 10,000 and the crew numbered about 925.

Both the AP and APA have considerable cargo space as well as accommodations for troops. Both are well armed and although they do not seek out the enemy, if they must they can engage in offensive as well as defensive operations. USS *West Point* mounted four 3"/50 and four 5"/38 dual-purpose guns as main armament, and four twin 40-mm antiaircraft guns. Most APA's have considerably less main armament, usually one or two 5"/38's and two or four twin 40-mm antiaircraft guns.

Like the AKA which carries attack cargo, the APA carries attack troops, ready to go into action as soon as they land on a beach. Also, like the AKA, it is an auxiliary by type, but a combat (amphibious) ship in operation.

REPAIR SHIPS AND TENDERS

Repair Ships

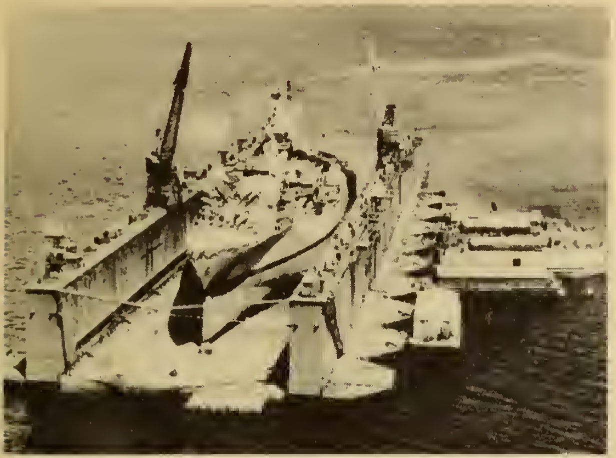
The repair ships perform repair and maintenance functions that are beyond the capabilities of the ship's own facilities or personnel. They are floating shops with skilled workmen that represent a wide variety of mechanical and electrical trades. Many delicate optical and navigational instruments can be repaired or parts supplied and installed, or underwater cutting and welding can be done; engine and hull repairs are performed, as is machine work and electrical and electronics repair. Aboard there are foundries, forges, and machine tools of many types. There are instrument shops, carpentry shops, boat shops, and boat-engine shops. Medical and dental facilities are available as well as the services of laundry, tailor, and cobbler shops.

Formerly repair ships were intended primarily for repairing battleships and cruisers while destroyer tenders and submarine tenders serviced the DD's and subs. During the past war several types of repair ships were developed for specialized types of work, some of them performing tasks that formerly were impossible of accomplishment except at naval shipyards. Some of the types of repair ships that were added during the war are the heavy-hull repair ship (ARH), battle-damage repair ship (ARB), an internal combustion engine repair ship (ARG), a landing craft repair ship (ARL), and an aircraft repair ship (ARV).

Most of these are modifications of the typical Navy repair ship (AR), although the ARB, or battle-damage repair ship is an exception. This type is actually a converted LST and has a shallow draft. It is equipped with diving equipment. Most of the repair ships now in use were built during the war. USS *Ajax* (AR6) is one of these and a few data regarding this ship will serve to illustrate the Navy's modern repair ships. The over-all length is about 530 feet and the extreme beam is about 73 feet. The *Ajax* has a designed speed of 19.2 knots, and in this we see evidence of the new trend toward speed in all the ships of the train. (The old USS *Rigel*, AR11, commissioned in 1922, had a designed speed of 10.5 knots). *Ajax* has accommodations for about 1100 personnel and the armament for her class is four 5"/38 dual-purpose guns in her main battery and four twin 40-mm antiaircraft guns.

Floating Drydocks. The postwar designations for floating drydocks are: AFDB (auxiliary floating drydock, big), those of 30,000 tons or more; AFDM (auxiliary floating drydock, medium), those of 10,000 tons to 30,000 tons; AFDL (auxiliary floating dry-

REPAIR SHIP
USS *Vulcan* (AR5) is a typical repair ship. These ships are floating machine shops with skilled workmen aboard that represent a wide variety of trades.



FLOATING DRYDOCKS
This floating drydock can accommodate a battleship. Their capacity ranges from 56,000 to 100,000 tons.

dock, little), those less than 10,000 tons; and AFDL(C), small, concrete drydocks.

The use of floating drydocks in World War II enabled many ships that were damaged in combat to receive repairs near the battle areas and to be rushed back into the fight as soon as possible. The largest of these, the AFDB, was formerly designated as ABSD, the letters meaning advance base sectional dock. This type can accommodate a battleship or one of the largest aircraft carriers.

Early in the war, the fate of USS *O'Brien* pointed up the need for some means of performing major repairs on badly damaged ships without the necessity of a long trip back to the States. USS *O'Brien* received some repairs near the scene of damage and then set out across the Pacific to receive the extensive repairs that were necessary before she could be returned to combat. En route the ship broke in half and sank, the long voyage being too much for her weakened hull.

Some of the floating drydocks are self-propelled, some are not. They usually tie up in sheltered waters and can be lowered to "scoop up" the ships to be repaired. The lowering process is performed by tanks which are flooded for submerging and then pumped out after the damaged ship has been floated in. The drydock's hull rises and the ship, braced to prevent it from tipping within the enclosure, is ready for the operations that must be performed on her. Very often it is necessary for a diver to cut away jagged projections of metal on the ship's bottom or sides before she is floated into the drydock's enclosure, for the margin of width allowed for ships to be repaired is figured quite closely.

Tenders

Tenders perform repair work, supply parts, and render other services to the ships they serve. Usually each tender services from six to eighteen ships. The ships may tie up alongside it, or boats may be sent to it from the ships requesting services or advice.

Two of the best-known types of tender are the destroyer tender (AD) and the submarine tender (AS). There are, of course, other types of tenders, as for example the AGP or motor torpedo boat tender, the ARS(T) or salvage craft tender, and the AV or seaplane tender. The AV's are of several types and their class names indicate the services that they are intended to perform: catapult lighter (AVC); seaplane tender, destroyer, (AVD); aircraft-rescue vessel (AVR); aviation supply ship (AVS).

"FIELD HOSPITAL" FOR SHIPS
Another view of the floating drydock that speeded up the repair time for ships damaged in combat in World War II. These drydocks were transported in sections and assembled on arrival at their destination.

The submarine tender (AS) probably offers a wider variety of services to the submarines it tends than do the other types of tenders. Like other repair ships and tenders the AS usually has a chaplain stationed aboard; it provides medical and dental aid; it may have recreation facilities that the submarine does not offer. In short, in addition to offering the usual maintenance and repair services the AS also furnishes means for catering to the crew's welfare.

The typical AS carries a crew of about 1,400 and has an over-all length of some 530 feet. Armament is usually four 5″/38 guns in the main battery and four twin 40-mm mounts in the antiaircraft battery. Some of the submarine tenders are capable of a speed of 18 knots; for others the range of speed is from 12 to 16 knots.

OILERS AND TANKERS

General

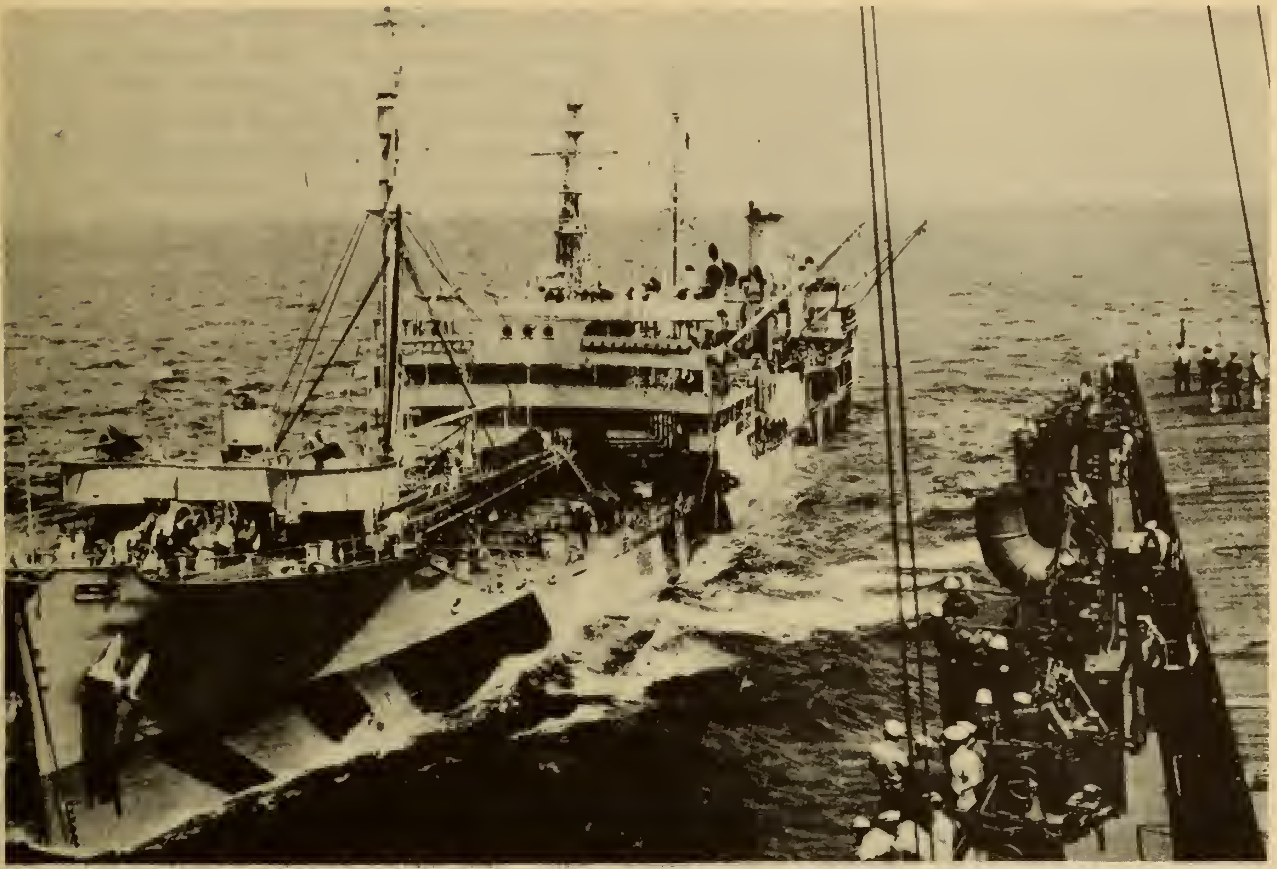
As previously stated, supplying fuel oil to the fleet is one of the most extensive assignments of the auxiliaries. The ships that perform this work are the oilers (AO's) and the gasoline tankers (AOG's). The Navy has some chartered tankers that are operated in cooperation with the Maritime Commission. Those that are discussed here are the Navy-type ships, that is, those that are administratively assigned to ComServLant, ComServPac, and CNTS.

AO and AOG

Practically all of the oilers (AO's) carry a large amount both of oil and of gasoline, whereas most gasoline tankers (AOG's) carry a relatively small amount of oil and a large amount of gasoline. (Some AOG's carry mostly oil, and some carry only gasoline.) A few figures will help to illustrate the capacities of these ships.

USS *Genesee* (AOG8, commissioned in May 1944) has space for about 410,000 gallons of gasoline and

THEY KEEP THE FLEET MOVING
USS *Nantahala* (AO60) performs one of the most vital services to the ships of the fleet. She is shown as she traveled the waters of the Pacific during the war years in her protective cloak of camouflage.



TANKER ALONGSIDE A CARRIER
An ocean-going "filling station" draws close to a baby flat-top. Success of fueling-at-sea operations gave task forces ability to remain at sea for long periods of time.

about 8,000 barrels of oil. This includes diesel oil, lubricating oil, and probably tanks that may be used for gasoline. USS *Nantahala* (AO60, commissioned in June 1944) has a capacity of 788,000 gallons of gasoline and about 124,000 barrels of oil.

The AO's are considerably faster than the AOG's; speed of the former runs from 15 to 18 knots while that of the AOG's is from 10 to 14 knots. Over-all length of the *Nantahala* (AO) is about 550 feet, while the *Genesee* (AOG) is approximately 311 feet long.

The AO is heavily armed and usually mounts a 5"/38 and four 3"/50 dual-purpose guns as well as four twin 40-mm antiaircraft guns. The AOG is less heavily armed. It may have four 3"/50 dual-purpose guns and no antiaircraft armament or it may mount one 3"/50 dual-purpose gun and two 40-mm singles. Firefighting is obviously an essential skill for crews that man ships carrying so dangerous a cargo, and the Navy provides these ships with all the latest developments in firefighting as soon as their worth has been proved.

Approximately 200 Navy men live comfortably aboard an AO. The normal life aboard these ships is not so dangerous as it may appear, due to the extensive compartmentation of the ship provided by the cargo tanks, the development of special fire-fighting facilities, and the extensive training of the men.

Oilers carry other cargo besides fuel. Secured topside on the cargo deck may be landing craft, lubricating oil drums, PT boats, or Quonset huts. Other cargo, even more valuable perhaps from the point of view of the warships' crews, includes mail from home, fresh bread and water for the smaller ships, fresh vegetables and fruit, ice cream or new movies.

Fueling at Sea

The process of refueling a warship at sea has been under experimentation for years by the navies of the world. It is one of the most specialized services of the auxiliary fleet. Obviously, it is a hazardous operation even when carried out unhurriedly on a calm sea in peacetime, for there is always the danger of fire and collision. But speed of transfer is essential in war, for a group of ships engaged in this operation makes a very convenient target for the enemy. The ships must be fueled rapidly and while traveling at high speed. In some cases refueling must take place under the most unfavorable weather conditions, with high seas increasing the always considerable hazard.

Oilers can fuel every type of craft from the captain's gig to the *Iowa*-class battleships. Fueling is accomplished by passing cargo hoses from the oiler to the receiving vessel while both proceed at normal speed. Large cargo pumps discharge the fuel through the hoses which are supported by special fueling-at-sea booms positioned by means of winches located on the catwalk level. (The special fueling gear aboard Navy oilers is the primary difference between them and the modern commercial tanker.) Every detail of the fueling process has been carefully worked out by the United States Navy and frequent drill makes the operation normal routine under any conditions. The ship's organization book sets forth the duties of each man and the procedure as executed by the required personnel is one of the best examples of Navy teamwork.

TOWING, SALVAGE, AND RESCUE VESSELS

General

While certain types of naval auxiliary vessels are designed and equipped specifically for towing, or for salvage, or for rescue operations, it should be borne in mind that almost any of these types may in an emergency and to a limited extent perform all of these operations. Among ships as versatile and as adaptable as the auxiliaries, there is bound to be an occasional overlapping of functions to meet an unexpected situation.

ATF—FLEET TUG
The fleet tug is a seaworthy craft, powered by diesel electric engines.

Types of Tugs

There are four major types of ocean-going tugs. The ATF's (ocean tugs, fleet) are fleet tugs for combat operation with a large radius of action, good fire fighting and salvage equipment and all-around facilities. The ATA's (ocean tugs, auxiliary) are new seagoing tugs with a considerable radius of action and with some fire-fighting equipment and with little or no salvage facilities. The ATO's (ocean tugs, old) are tugs designed or constructed before or during World War I, ex-minesweepers used as tugs, and those having operating limitations which exclude them from classification as ATF's or ATA's. The ATR's (ocean tugs, rescue) are tugs with good fire-fighting and salvage facilities, but in general they have a limited radius of action.

There are two major classes of ocean-going tugs: the *Navajo* or Indian class of 1938-1942 and the *Algorma* class of 1917. The *Navajo's* displace 1,500 tons, are 205 feet in length and 38.5 feet in beam, with a crew of 93. They are armed with one 3-inch gun and several smaller automatic weapons. The *Algorma's* vary between 1,030 and 1,080 tons, are approximately 156 feet long and have a beam of 30 feet. These ships carry two .50-caliber machine guns.

Tugs are equipped with automatic towing machines, booms and varying amounts of fire-fighting equipment including fire monitors. These fire monitors are similar in appearance to a gun and permit water to be discharged through a horizontal arc of 360 degrees.

It would be difficult to mention all the duties performed by the Navy's tugs in war and peace. In addition to hauling and towing, they may perform firefighting and have, on occasion, patrolled, laid smoke screens, and pulled landing craft off the beaches. During the past war, one fleet tug returned two damaged LST's from Normandy to the United States; another towed a warship from North Africa to the United States. A pool of American and British tugs towed sections of the artificial harbors and other essential parts of the invasion armada across the English Channel in the D-Day assault on the Normandy beaches. The American tugs had already made the trip across the Atlantic under their own power.

Although the tug is not strictly a salvage vessel, most of them are capable of performing a variety of salvage and rescue operations. In such work, they may operate alone or in cooperation with other vessels. They have saved the cargoes of sinking merchant ships, and have removed casualties from ships or from the beach. They have taken part in the fighting —the log of one fleet tug shows that the crew went to general quarters over a hundred times during World War II. In peacetime they frequently assist Coast Guard ships in rescue operations.

Salvage and Rescue Vessels

The ARS is the typical salvage vessel. Additional types of salvage ships were developed to meet the needs of World War II, as for example the ARS(D), a salvage lifting vessel equipped with a derrick. This discussion takes up only the ARS, a type of ship that has been part of the train for quite some time. Formerly a wooden-hulled ship, the ARS like many of the auxiliaries was changed to meet conditions under which it had to operate in the most recent war. The Navy's modern salvage vessels are steel constructed and are designed for offshore work in distant waters. Their cruising range is about 5,000 miles. In addition to the ship's operating crew, there is a crew of 2 officers and 21 men aboard who are specially trained in salvage work. (During the past war, the Navy established a salvage school in the vicinity of the capsized *Normandie* and the men assigned received their training by actually performing salvage operations on that ship.) Qualified divers are assigned to these ships and in wartime this hazardous work is often undertaken under combat conditions. Sunken ships may have to be cut up, moved, or refloated. Often the divers have to salvage material from sunken ships, our own or the enemy's. Stores or machinery may be salvaged or valuable documents may be taken from ships that are under water. The ARS is equipped for normal diving operations in shallow water up to about 60 feet.

SALVAGE VESSEL
The ARS is a typical salvage vessel. Its cruising range is about 5,000 miles; it is designed for offshore work in distant waters.

A few data on USS *Chain* (ARS20, commissioned in March 1944) will furnish a general idea of the new-type salvage ships of the auxiliary fleet. Its overall length is about 214 feet and its speed is nearly 15 knots. It has accommodations for 7 officers and 113 men. The engines are diesel electric and the shaft horsepower is 3,000. For armament it usually carries two twin 40-mm's.

In addition to the rescue tug (ATR) previously mentioned, there is also the submarine rescue vessel (ASR). These ships are designed and equipped primarily to rescue the crews of sunken and disabled submarines. They are suitable for conducting diving in relatively deep waters.

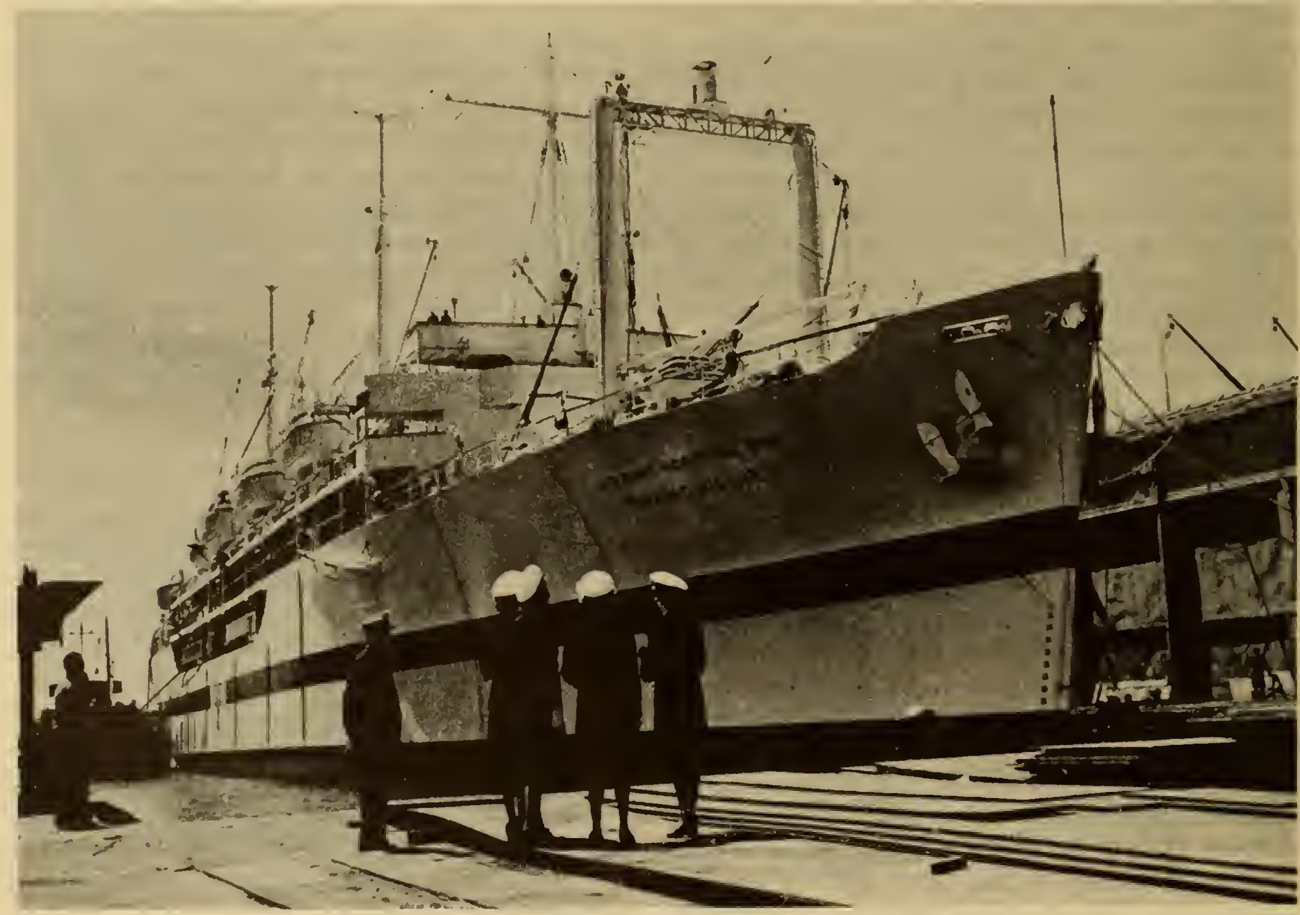
MISCELLANEOUS AUXILIARIES

Hospital Ship

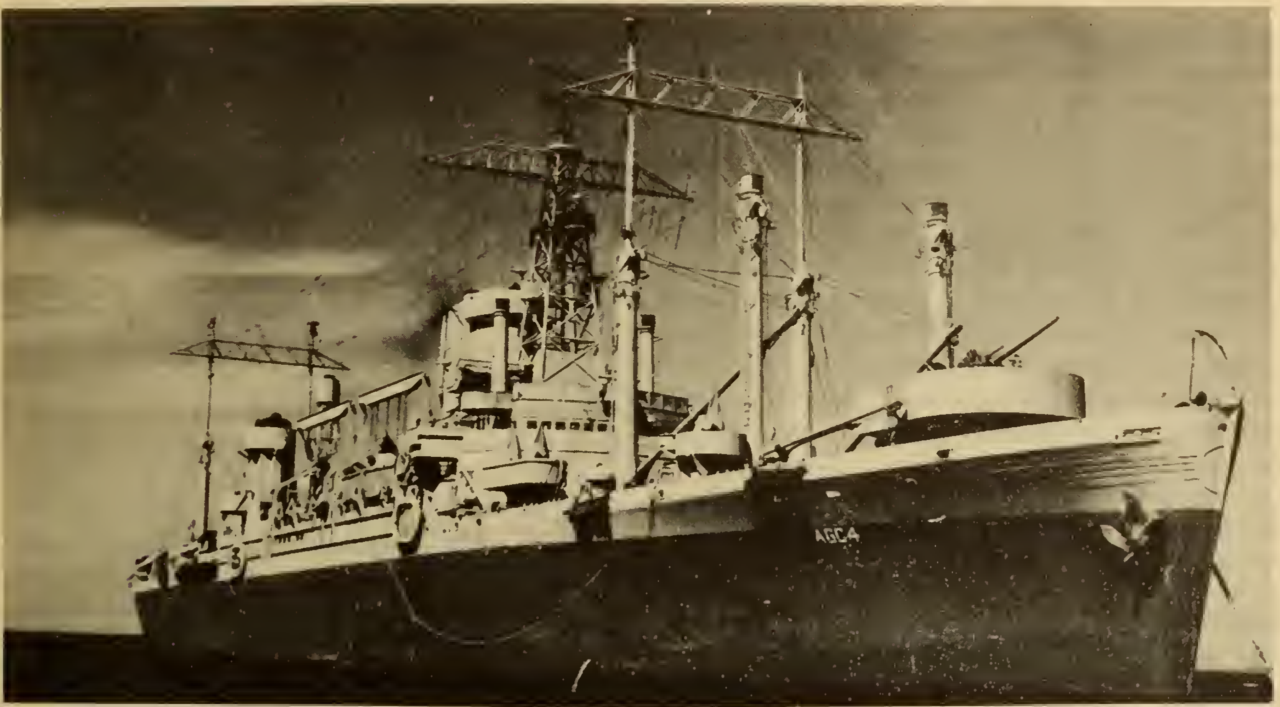
The modern hospital ship (AH) is as well equipped for providing temporary medical care as is a hospital ashore. Like the smaller APH, the hospital ship is designed to transport casualties and provide medical care en route. But unlike the APH which is a wartime innovation, the AH had been among the ships of the fleet for a number of years prior to World War II.

The names of the hospital ships indicate the services of these ships; a few examples are USS *Benevolence,* USS *Hope,* USS *Relief,* USS *Mercy,* and USS *Solace.* USS *Relief* is the oldest of the hospital ships. It was commissioned in 1920, and was constructed originally as a hospital ship, unlike all the other AH's which are converted, usually from passenger liners.

USS *Solace,* a 409-foot ship with bed space for over 400 patients, is one of the newer-type hospital ships. The *Solace* started its existence in 1927 as SS *Iroquois,* a passenger liner, and was commissioned in 1941 as a Navy hospital ship, with medical facilities that compare favorably with those of any modern city hospital. The hospital personnel consists of 17 medical officers, 2 dental officers, 21 nurses, and 160 hospital corpsmen. (This is in addition to the ship's crew which numbers about 450.) These experts are prepared to treat any ailment from those of the ear, nose, and throat to physiotherapy and psychiatry.



HOSPITAL SHIP
USS *Tranquillity* (AH14) is one of the Navy's 15,000-ton hospital ships of the Haven class, converted from Maritime Commission C-4 hulls. These vessels are completely air conditioned and provide medical facilities equal to those of a modern shore hospital.



AGC—AMPHIBIOUS FORCE FLAGSHIP

Designed to serve as communications center and provide space for commanders of amphibious operations, the AGC was literally "floating headquarters" for many Allied invasions in World War II. Like the APA and AKA the AGC is operationally an amphibious ship although it is an auxiliary type.

During a 16-month period in the years 1942 and 1943 her medical personnel had taken care of more than 10,000 patients, 7,500 of whom were war casualties.

A hospital ship functions like a Navy ship with a tremendous sick bay. Maintenance and handling of the ship are the responsibility of the line officers and crew. Chaplains care for the morale and spiritual welfare of the personnel and arrange for their entertainment. Many of the comforts of an expensive convalescent ward ashore are made available to the sick or wounded: easy, comfortable chairs, books and magazines to read, the newest movies every night, and the finest food available anywhere.

By international law and agreement at Geneva, the hospital ship is clearly marked as such and is accordingly immune from attack by belligerents. There are instances, of course, where belligerents have fired on hospital ships, in spite of this law. Its white hull, with the long horizontal green stripe along its side and a red cross on the stack and on the side, is unmistakable.

Amphibious Force Flagship

The amphibious force flagship (AGC), sometimes called the headquarters ship, is a development of the recent war. It is an example of the centralization of a vast amount of communication equipment. With almost every known type of communication gear installed, these ships served essential command and communication purposes in opening the roads to Berlin and Tokyo. They were the answer to the needs of a commanding officer in conduct of large-scale operations involving Army and Marine troop units, Army and Navy aircraft, and the many types of naval surface and subsurface vessels. Even a decade ago, it would have been considered an impossibility to operate so many radio circuits in one ship, but now, through the technical advances in electronics, it is possible for the typical AGC to operate more than sixty radio transmitters and over a hundred receivers without difficulty. One of the AGC's, USS *Appalachian* (AGC1), inevitably received widespread publicity during the atomic explosion tests conducted at Bikini after the past war. Aboard was a group of news correspondents assigned by various news associations and newspapers to cover the story of the tests. Apart from this function, the ship also served as a headquarters ship.

All of the AGC's were commissioned in the years from 1941 to 1944, and all are converted from various types of merchant ships. Their over-all length is usually about 460 feet and most of them are capable of a speed of something over 16 knots. Like the *Appalachian*, all have flag accommodations in addition to the regular crew accommodations. Ship's company numbers about 500 and there are flag accommodations for 101 officers and 267 enlisted men. Armament consists of two 5"/38 dual-purpose guns and four twin 40-mm's. All are named for mountains such as *Adirondack, Blue Ridge, Pocono,* etc.

District Craft

Among the hardest-working ships of the Navy are the district craft. Not primarily fighting ships, they are for the most part unarmed. These are utilitarian ships which serve a variety of purposes in continental and overseas harbors, in sea frontiers, convoys, amphibious forces, and in task forces. They are small, but despite their lack of size, are of incalculable use to the Navy. Their designations usually start with the letter *Y*. A few of the class names will serve to show the wide variety of duties which they perform: floating derricks (YD); degaussing vessels (YDG); diving tenders (YDT); ferryboats and launches (YFB); dredges (YM); net tenders (YNT); fuel oil barges (YO); gasoline barges (YOG); oil storage barges (YOS); floating workshops (YR); and water barges (YW).

Conclusion

Duty aboard the auxiliary ships is considered "good duty" either in peace or in war. The ships are comparatively small and the duty of personnel aboard is of necessity less specialized, both for officers and for enlisted men. Department heads frequently perform the duties of two such officers aboard a larger vessel. For the enlisted man, too, there is the opportunity to work at the duties of rates other than that which he holds. There is, perhaps, less formality than is encountered aboard the big ships of the fleet, and even though all the auxiliaries are taut ships, obviously a slightly greater measure of personal freedom is possible where a hundred or less men are involved than is possible in handling a thousand or more.

Not all types of auxiliary ships have been discussed here. An attempt has been made merely to give the reader a grasp of the wide variety of types and functions represented by these ships, and an understanding of the vital part that they play in keeping ships and personnel afloat supplied with the services that are essential to them in fulfilling their assigned duties with the fleet.

CHAPTER 16

RECOGNITION OF SHIPS AND PLANES

INTRODUCTION

General Importance in World War II

Fleet Admiral Chester W. Nimitz, Commander-in-Chief, U. S. Pacific Fleet and Pacific Ocean Areas, at the end of World War II described the importance of recognition in these words: "If there is one lesson we have learned from the Pacific war, it is that constant training in visual recognition and identification for all topside battle-station personnel on board ship and for all aircraft personnel is of vital and urgent importance."

The closer we came to the knockout blows as we moved in toward Japan proper, the more important recognition became. As Fleet Admiral Ernest J. King, Commander-in-Chief, U. S. Fleet, and Chief of Naval Operations, pointed out: "The approach of U. S. forces to the Japanese homeland will bring Allied and enemy ships and aircraft in closer proximity. Visual recognition will play an even more important part in operations, and no opportunity should be lost to give personnel all possible training in the appearance of friendly and enemy ships and aircraft."

The more combat duty a man had, the more he understood the truth of Admiral King's statement. Although at first a few exceptions felt that they were such good fighters with their planes and guns that they needed only their slugging strength, more and more they learned that they simply must use their eyes and discover whom they were killing. There was little heroism in blowing an Allied plane out of the sky or sinking an American ship.

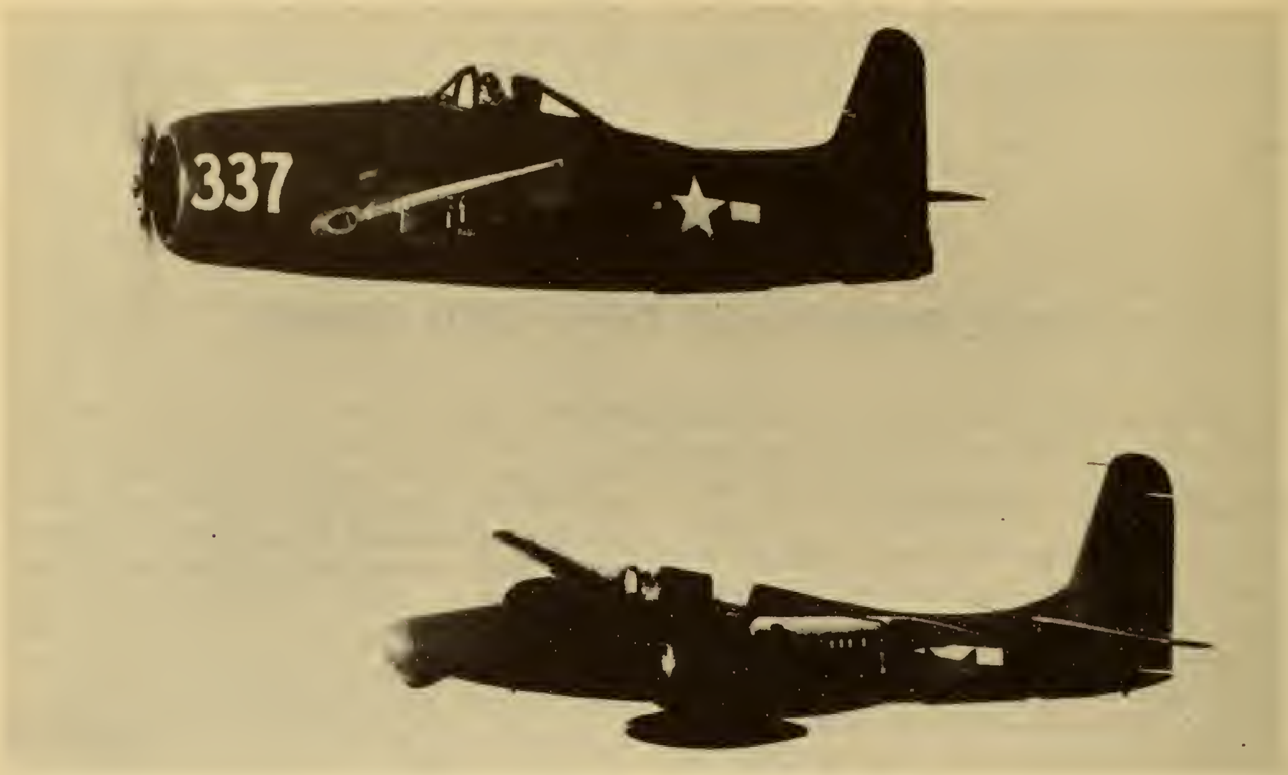
High-ranking Army officers were in complete accord with the Navy about the difficult problems involved in proper recognition and the need of intensive training. H. H. Arnold, General of the Army, Commanding General, Army Air Forces, stated his point of view in the following words: "An airman, beyond having to make the usual decisions of how, when, and where to attack, is also frequently faced with another problem: whom to attack. Aircraft and ship types, our own as well as those of the enemy, are rapidly outmoded, and as rapidly replaced with new developments. Instantaneous recognition of aircraft, which move at constantly increasing speeds, is a combat advantage of first importance. No one should be assigned to a theater of operations without thorough and precise training in the identification of all friendly and opposing ships and airplanes."

But General Arnold's ideal was not always realized, and especially during the early days of the war the Allies found themselves in the tragic situation of being unable to distinguish among their own planes and ships and Germany's and Japan's. It was an appalling situation when they kept on knocking down their own planes, sinking their own ships, and killing their own men.

Importance of Plane Recognition in World War II

Early in the war a Navy lieutenant, aged 26, was doing some advanced acrobatics in an F4F Wildcat, and a couple of ensigns, aged 21, watching him from the ground remarked, "Not bad—for an old man."

The ensigns were unconsciously expressing the truth which became more and more apparent as aviation



KNOW YOUR AIRCRAFT AND PREVENT FATAL ERRORS
Above, an F8F Bearcat; below, an F7F Tigercat, typical American naval aircraft.

progressed: World War II with its tremendous emphasis on high speeds was a young man's war.

The war had not advanced very far before responsible officers realized that there was not much use in building expensive, fast planes and training young men to fly them if we could not recognize the difference between ours and the enemy's.

As the complexity and fury of war increased, informed observers soon realized that even the sure recognition of friend and foe was not enough. If planes were approaching, a man had to know, and to know fast not only whether they were hostile but also their wingspans, approximate speeds, and probable armaments and to make a reasonable guess as to their future actions. Obviously a gunner faced with a large flying boat and a gunner faced with a fast fighter have two entirely different problems.

And a corollary also held. It was more than just too bad if an officer or an enlisted man permitted the plane that he was mistakenly sure was friendly to fly through and bomb American hangars, planes, and ships—and American men.

World War II established recognition as a vital technique of modern warfare. This fact was acknowledged not only by Great Britain and the United States but also by Germany and Japan. It was proved by too many tragedies where recognition was careless or neglected and by many unreported incidents where successful recognition fell into the pattern of victory.

History of Recognition

In 1918 some of the older chief petty officers of the Navy with a broad background of experience at sea prided themselves on being able to recognize ships a long way off, but they were exceptions and self-trained. How much recognition was a product of World War II can be realized when one learns that not only was there no recognition training in the U. S. Navy on 7 December 1941 but also there were no recognition instructors. Indeed, the Navy had so few airplane models to teach from that it made a nationwide appeal to high school boys to lend theirs and to develop others. And the Navy itself went to work initiating a program of recognition material consisting of manuals on aircraft, flash cards, and a few animated movies based on the Weft System.

In May 1942 a Recognition School was established by the Navy at Ohio State University under the direction of Professor Samuel Renshaw, who had developed a method of identification through total form perception. The Bureau of Naval Personnel took over the administration of the Recognition School on 1 January 1943, and plans called for the training of 1,200 officers at the rate of 175 a month. Graduates were ultimately placed in all appropriate naval activities.

Beginning about 1 March 1943, most officers graduating from the school were sent to Purcell, Oklahoma, to undergo 30 days' training at the Naval Air Gunners' School and a few to the Air Combat Information School at Quonset Point. The reason for the additional training was that fleet commanders needed officers not only for recognition but also for gunnery and air combat information (ACI) and that the three activities were closely related.

In all, some 800 officers were graduated from the Recognition School by the time it closed in August 1943.

Future of Recognition

For a short time after World War II recognition fell into neglect, which was only natural since there were no more German and Japanese planes and ships to recognize. Some uninformed persons believed that with the possibilities of push-button war just around the corner and of air forces equipped with supersonic fighters and bombers, the human eye would be impotent, and electronic devices would be needed to make accurate identification.

But push-button warfare will not be a reality for years. Furthermore, all mechanical identification devices are subject to failure. A nightfighter, for example, would be reluctant, and rightly so, to trust his radar in making identification of another nightfighter as enemy until, even though light was dim, he checked with his own eyes. A second possibility for him as well as for men on shipboard identifying both planes and ships would be that apparently genuine pips might be caused by tinfoil particles scattered by the enemy.

Even for the inexpert it is obvious that in complicated aerial warfare, planes both friendly and enemy become so inextricably mixed up that no mechanical device could possibly be invented that could exercise the judgment possible in an experienced human eye well trained in recognition techniques. Mechanical devices are admirable for the purposes for which they were designed, but even at their best they are incapable of thought—and incapable of changing their minds—when new exigencies arise.

Furthermore, as yet no mechanical device has been devised that can locate positively and identify planes flying a few feet off the water or using undulating land to confuse the radar screen.

And finally, even if new and more marvelous electronic devices were invented and adapted to recognition purposes, the United States and other countries would probably invent countermeasures that would render the new equipment more or less ineffective.

In this atomic age a little less than full credit has perhaps been given to the human eye and its remarkable adaptability. During World War II, naval aviation cadets were accustomed to recognize flash pictures of planes on a screen at speeds between 1/25 and 1/100 of a second. It must be pointed out also that even with a plane flying at 1,500 miles per hour toward a target 5 miles away, it takes 12 seconds for it to reach the target.

Errors in Recognition

It may seem strange today that early in the war the Allies often shot at their own planes and ships. The British whose aircraft looked very unlike the Nazis' made such tragic errors that they jeopardized the Battle of Britain. It was no accident that British officers came to the United States on a special mission in 1942 to tell American officers how important recognition was in modern warfare.

This is one of the stories the British told:

> It was a great day for us. A flight of our torpedo planes spotted our deadly dangerous enemy, the German 42,000-ton battleship *Bismarck* with eight 15-inch guns, twelve 5.9, and a whole arsenal of small guns. Daringly we closed in, and gloatingly we dropped our fish.
>
> Our hearts sank when we saw the torpedoes go

> wide of their mark. And then, awful moment, we found that we had made a mistake in recognition. The German battleship turned out to be an English cruiser. Whereupon our squadron flew over it and signalled laconically, "Sorry. Pardon our kippers."

This is a story that the Americans had to tell after they got in the war:

> It was a nervous day for us. We were in on the invasion of Sicily in tough enemy country. Some 700 yards from our target we heard the hum of planes over our stern. "Don't shoot; they're P-38's," cried the airplane spotter. Thrack. Thrack. Thrack. Bombs began to explode to port and up on the bow. "I was wrong. Let 'em have it," cried the spotter. Someone else shouted, "Timber!" Everyone crouched down behind the splinter shields. A seaman rushed up and yelled, "We got hit, portsides, amidships." He added cheerfully, "We're not sinking, though." The planes came back strafing. A seaman swore, "———, mate, ain't this a mess!"

Here is one of the stories the Japanese told about the Battle of the Coral Sea. Not all mistakes in recognition were made by the Allies. Commander Sekino of the Japanese Navy was describing an incident that had important repercussions:

> On 7 May, the day when the *Shoho* came under American attack, the Japanese scout planes made wrong identification and directed the attack of the *Shokaku* and *Zuikaku* planes to American tankers, instead of to American carriers, thereby seriously upsetting the entire succeeding battle tactics of the Japanese task force. After dropping their bombs on the American tankers, the *Zuikaku* and *Shoho* planes were returning to their carriers when they saw the American carrier force. Unfortunately they did not have any bombs for attack. Some planes mistook the American carriers and attempted to land on board.

As a result of the damage to these two important carriers during this battle, the *Shokaku* was prevented from being used in the Battle of Midway and delayed

AS DEADLY AS HIS EXPRESSION
A shark-faced B-25 Mitchell closes in for the kill on a Japanese frigate.

operations for the occupation of Port Moresby. Thus a recognition mistake by the Japanese led indirectly to their defeat in two important phases of their war against the United States.

RECOGNITION TECHNIQUES AND SKILLS

Learning by Experience

The British had to learn recognition the hard way. Nazi attacks on English training centers had impressed on the RAF the importance of knowing all aircraft. Sweeping in at opportune times, heavily armed Nazi fighters had field days knocking down defenseless trainers. When Hurricane squadrons rose to stop them, their pilots were overeager, and as a result the number of Hurricanes shot down by Hurricanes went up at frightening rates.

"Trigger happy" was the description given not only to Hurricane gunners but to gunners of all nations, especially during the early part of the war. All air and ground gunners used to be satisfied to ask only one question, "Is it in range?"

The result was that many aircraft were shot down by their friends and their crews killed at times when they could be ill spared and that many enemy aircraft were not shot at. Peter G. Masefield, the well-known British aeronautical expert, has said,

> In the beginning enough R. A. F. planes were shot down over England to pose a serious problem. The loss of airplanes in these circumstances from a none-too-plentiful production, combined with the tragically heavy loss of life, especially impressed Lord Beaverbrook, then Minister of Aircraft Production, with the need of improved training in aircraft recognition. Accordingly, the Director General of Aircraft Distribution, Mr. Eric Bowater, was instructed to set up a department within the Ministry to prepare all the necessary training and reference material on an official basis and to cooperate closely with the Services in meeting the needs.

That such a program was desperately needed in England is proved by Mr. Masefield's statement: "Official records show that almost without exception every type of combat or training airplane in the R. A. F. has been shot at, up, or down by British gunners."

Early in the war with Japan, so crude was American skill in recognizing planes that aviators often could not tell the difference between two such dissimilar planes as our P-40 Warhawks and the enemy's Zekes (or Zeroes as they were then called).

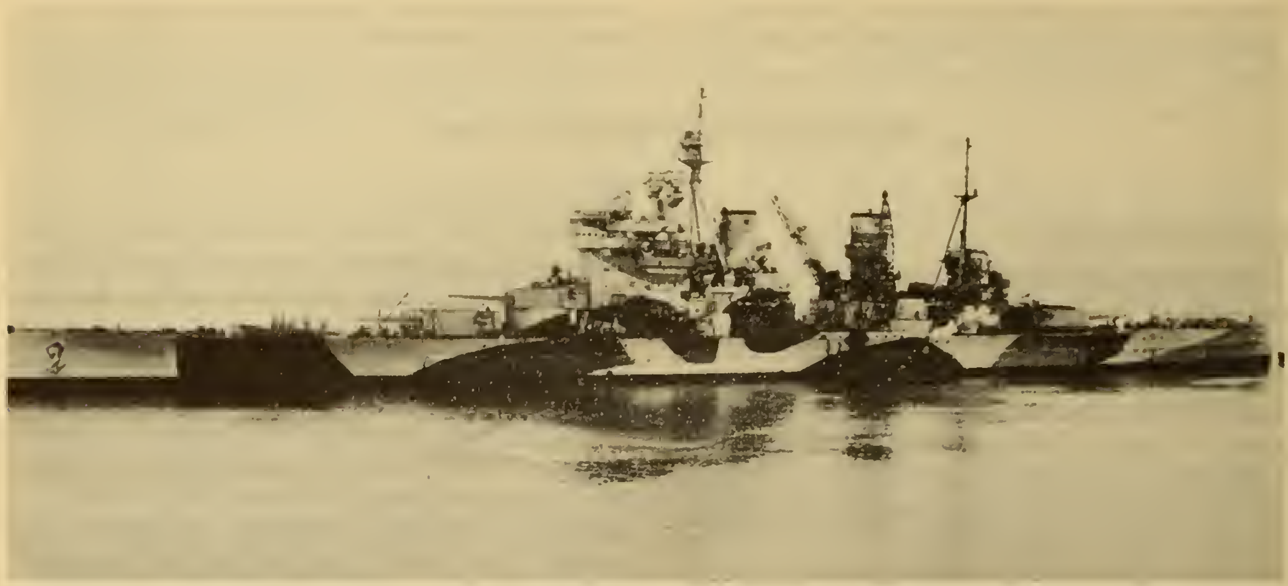
When the United States sent to England the Eighth Army Air Force, the Americans passed up their chance to learn recognition the easy way. Though warned by RAF experience, nevertheless American airmen tended to shrug their shoulders about the importance of recognition. At first everything went smoothly. The first Fortress raids built up a legend of invulnerability. Fast German fighters were too slow for our lynx-eyed gunners.

But when the Nazis discovered the earlier underarmed nose, B-17's began crashing, burning, and exploding in great numbers. As our losses mounted, the entire daylight bombing program became endangered. From then on, all fighters approaching bomber formations were considered a threat, and B-17 gunners tended to shoot first and then recognize. Allied as well as enemy planes suffered.

Despite attempts at coordination by both commands, nothing materially reduced the losses until the first fully escorted United States bomber raid against Antwerp on 4 May 1943. Under an umbrella of P-47 Thunderbolts, the Flying Fortresses sailed out, sailed over, and sailed back, untouched. After this demonstration, a B-17 gunner who could not tell the difference between a Spitfire and a Thunderbolt and an FW-190 or an ME-109 looked upon himself as being not merely stupid but also criminal. So did the other crew members.

Recognition and National Characteristics

Assuming that a person is completely ignorant about the sea and seagoing vessels, what should he learn first to enable him to recognize ships? What are the fundamental principles by which one may recognize the differences between an American tugboat and a British battleship?



BRITISH BATTLESHIP
HMS *King George V* has blocky utilitarian lines.

A beginner may start with this bedrock general rule: Every major sea power has a philosophy of naval architecture all its own. Among the nations of the world, sharp contrasts in geography, foreign policy, trade routes, and national resources create naval problems which demand different answers both in strategy and in ship design. Every navy stresses different qualities and features when planning a battleship, cruiser, or destroyer. Therefore national principles of design develop, which, fortunately for recognition, are visibly expressed in the ships themselves.

The United States and Great Britain have and Japan used to have individual styles of construction which appear most clearly in their battleships but are repeated with variations in cruisers and destroyers.

General Appearance of American Warships Contrasted with Others

This is the general rule for American warships: They show concentration and streamlining. Their superstructure is piled up in clean pyramids.

This is the general rule for British warships: They show simplicity in design with many right angles and squared-off surfaces and right-angled masses in the shape of blocks or bricks. Their stacks are more prominent and more easily seen.

This used to be the general rule for German warships: They had clean design and slick lines. Superstructure was smooth and flowing. Stacks were streamlined and capped. Silhouettes and turrets were long and low.

This was the general rule for Japanese warships: They showed a pagoda bridge and a scattered superstructure with elements isolated on the hulls. The outline was separated and broken.

How to Recognize Types of Ships

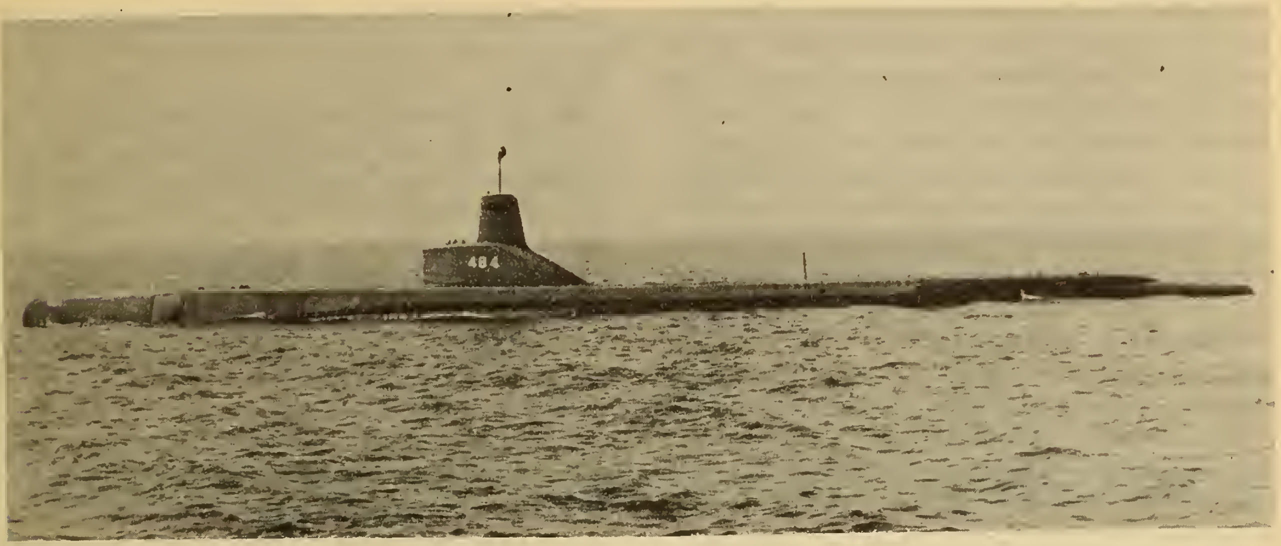
Second in importance to the recognition of nationality is the recognition of type of warship.

Here are the basic rules for the United States Fleet:

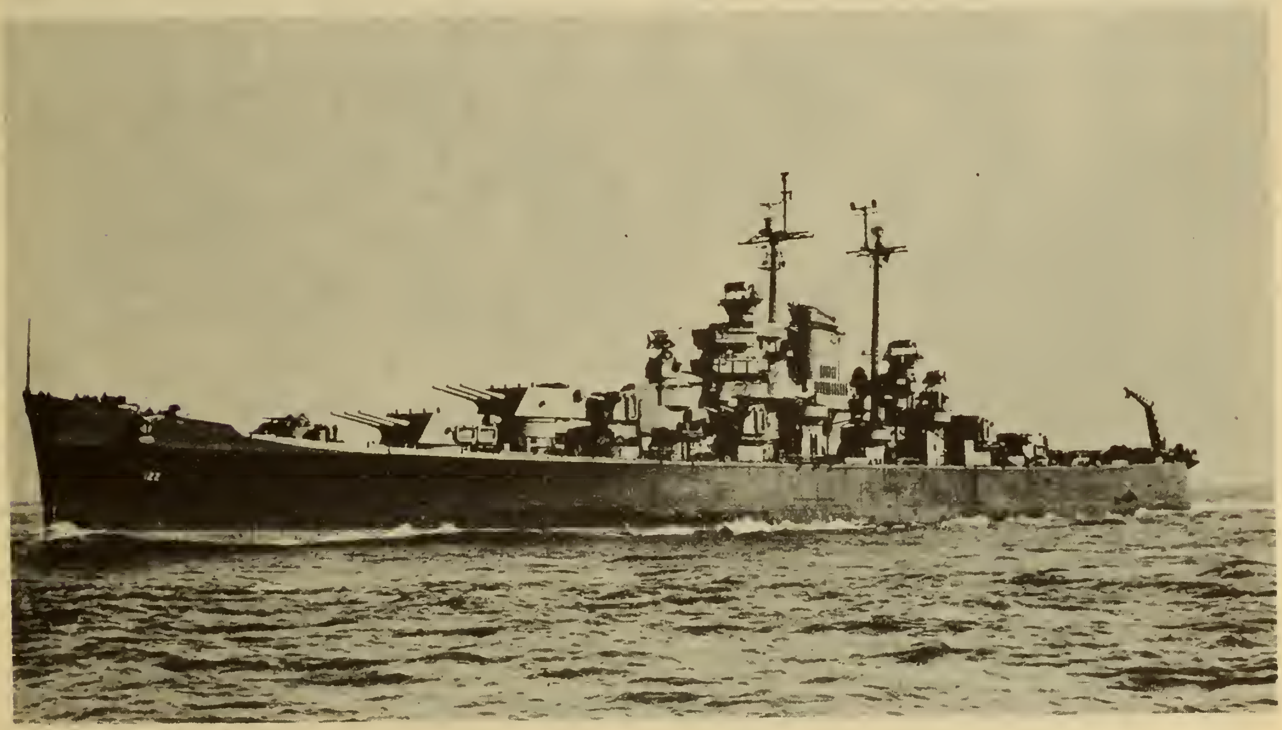
1. A single pyramid topped off with a lighthouse tower indicates a battleship. All operational types of American battleships have vertical stacks.
2. A split pyramid generally indicates a cruiser. Cruiser stacks are raked.
3. An off-center pyramid and lack of after superstructure indicates a destroyer.

The breakdown by nationality in ship recognition is only the first step. A Navy man must be able to recognize warships by classes.

Here is why. If you were a flier in World War II, you had to make a better reconnaissance report when



IN GENERAL, AMERICAN SHIPS SHOW STREAMLINING
Surface broadside view of the USS *Odax* shows up the new streamlined contours of one of our submarines.



CRUISER STACKS ARE RAKED
USS *Fargo*, one of the new light cruisers.

you landed on your carrier than simply, "It was a Jap battlewagon." Your commander could not do enough with that, for the firepower, protection, and speed of different Jap BB's were so varied. And furthermore the presence or absence of a particular battleship might affect the entire strategy of the war. So your commander had to know whether he had to deal with the powerful *Yamato* class, which was considered to be an equal of our own *Iowa* class, or with the *Kongo,* which was considered to be approximately an equal of our old-fashioned *New York.* Moreover, identification of the specific class seen, damaged, or sunk was vital to Intelligence.

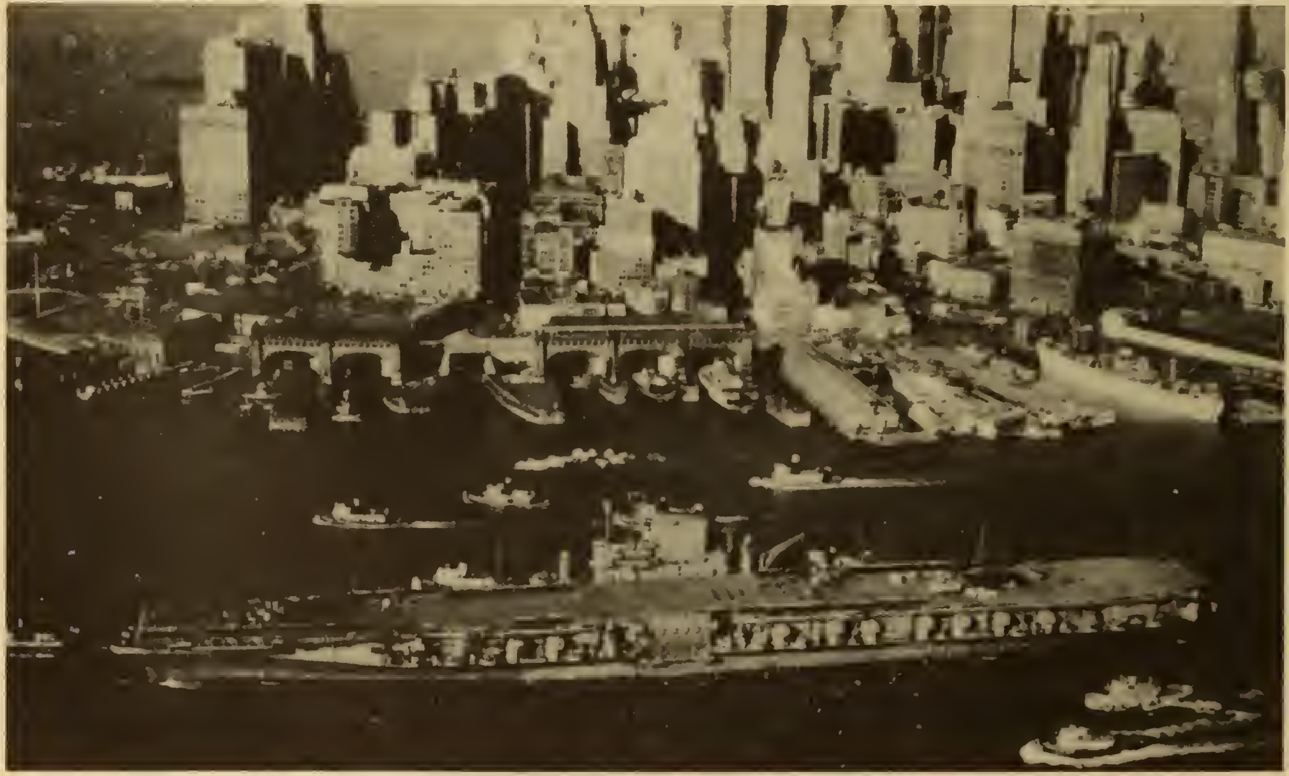
And so the recognition of ships at sea in terms merely of national characteristics is acceptable only when weather and distance blur ship details and leave the spotter with simply an impression of total form.

Hull Shapes from the Air

World War II, especially the operations against Japan in the Pacific, was primarily a war of planes against ships. In naval aviators, accordingly, the ability to recognize hull shapes from the air was highly valued. .

The skill involved was something any aviator could learn, for he could easily understand that the hull determines a ship's mass or total form. After two minutes of explanation he could see the essential differences in profile between a battleship and a cruiser if he grasped the underlying contrasts in hull shapes. The height of the superstructure and the weight of the guns must always depend on the length and breadth of the hull on which they are mounted.

Hull recognition was particularly important for Army bomber crews flying at high altitudes, for often they could not see ships distinctly until their planes were directly overhead. From this angle the details of a ship's superstructure are obscured and leave the hull outline as the only visible feature. Though identification of class or nationality is next to impossible for air crews flying at high altitudes, nevertheless accurate reports of type—carrier, destroyer, submarine—



USS *MIDWAY* IS EASY TO RECOGNIZE

Outstanding recognition marks of the *Midway* are the huge tapered stack amidships and the stepped-up island.

can be fitted by intelligence centers into information patterns of great value.

The differences and individualities in hull shapes result from the varied naval tasks for which the ships were built. Tremendous beam marks the battleship which must serve as a stable platform for the heaviest of guns and be thoroughly compartmented to withstand heavy-caliber hits.

Destroyers, on the other hand, must be extremely swift, maneuverable, and easy to build in large numbers. Consequently they are trim and compact, with space and equipment cut down to a minimum.

Carriers, which are essentially floating airstrips, always appear like rectangles, and the longer the rectangle, the more modern the carrier.

A difficulty in ship recognition from the air is that fundamental shapes undergo many variations in different navies and in different classes. Thus, though some modern American cruisers usually show transom or squared-off sterns, the most recent types like the *Oregon City* CA and *Des Moines* CA have rounded off considerably. The modern British and Japanese cruisers retain the tapered sterns of older cruisers.

The fundamental principles of construction should be known by all men in the Services. If a man can memorize the length-to-beam ratio, he will not go far wrong in spotting different types of ships as seen from the air.

Silhouettes from the Horizon: The Bump System

If the recognition of ships from high overhead proved to be a difficult task, no less difficult was the recognition of ships from great distances by means of silhouettes. Though three or four ships might be seen as only three or four tiny dots, though the visibility might be poor owing to fog, nevertheless it was extremely important to determine whether they were submarine tenders, battleships, aircraft carriers, cruisers, or destroyers. Their mere presence meant a great deal in battle strategy.

Consequently many experienced men tried to work out systems for recognizing ships quickly and accurately from great distances. The one most used in World War II was the so-called Bump System, a silhouette method of recognition. It was worked out by officers of the Coast Guard Artillery and proved much more reliable for recognizing ships than the plane view from overhead, because a silhouette remains a silhouette until an aviator is directly overhead. Furthermore, by a silhouette an aviator can recognize not only nationality but also class whereas overhead he can recognize class only with difficulty.

The basis of this system was the presentation of the total form of ships seen as rough outlines which emphasize the characteristic upper portions of the ships' superstructures reduced to simplified silhouettes.

Reducing the recognition of ships according to national characteristics to the simplest statements possible, we may formulate three rules.

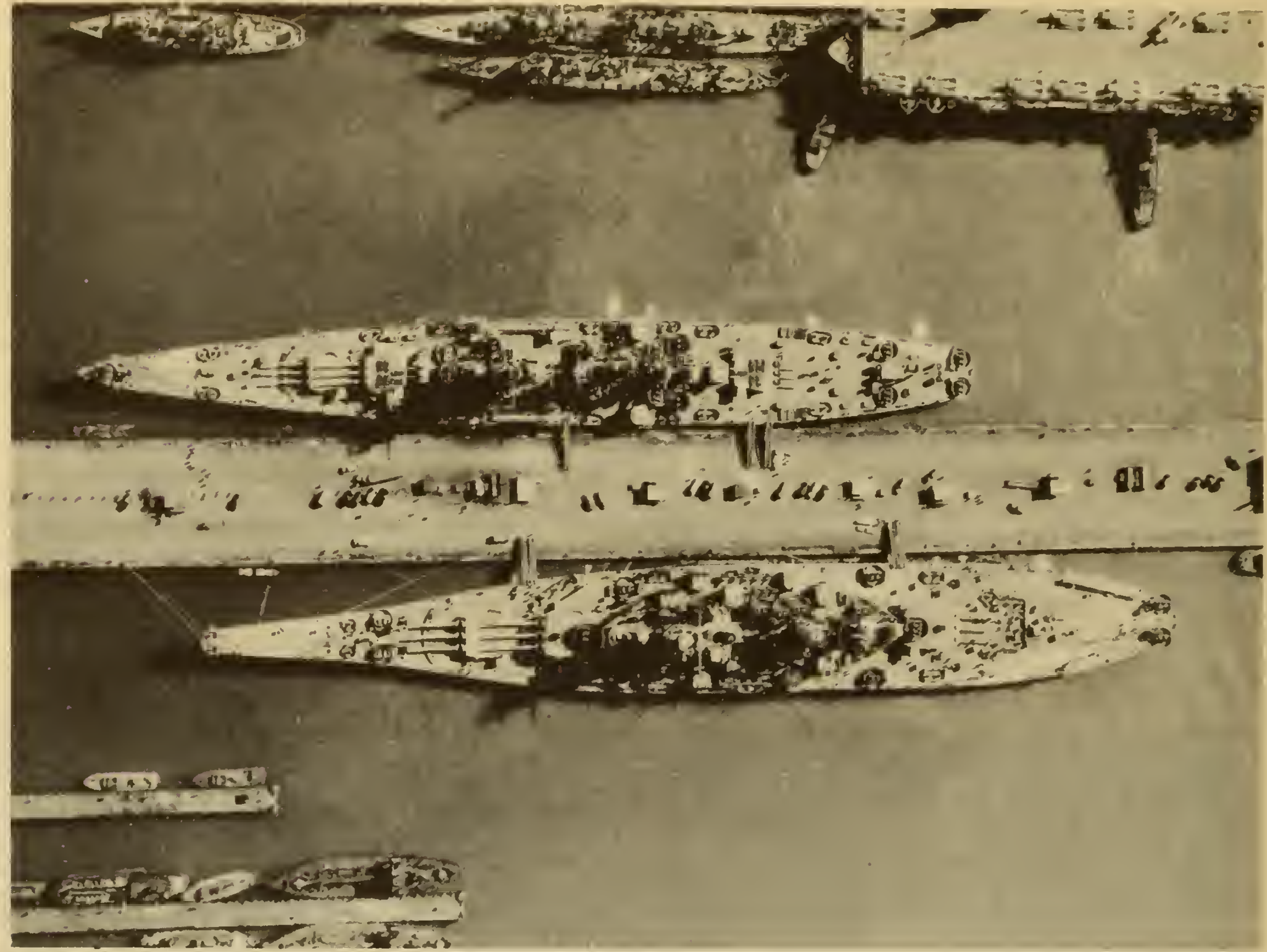
1. The United States pyramids its superstructure elements into concentrated, streamlined masses.
2. Great Britain shows clean, prominent funnels and a square blocklike superstructure devoid of streamlining.
3. Japan showed guns, stacks, masts, and superstructure scattered in distinct, widely separated elements.

A little training in the bump relations enabled an observer to spot a ship according to nationality even when it was hardly more than the size of a pinhead on the horizon.

WEFT, WETFUR, and Renshaw Systems

How was the recognition of planes taught during World War II to future aviators, gunners, and civilian spotters? The British began by using the now obsolete systems called WEFT (Wings, Engines, Tail, Fuselage) and later the WETFUR (Wings, Engines, Tail, Fuselage, Undercarriage, Radiator). Because these systems were dull and unnatural, they were either inefficient or dangerous. The basic trouble with these techniques was that planes are seen as a unit from a thousand different perspectives and angles, not as separate units always static.

Dr. Renshaw, the Ohio State University authority on eyes and vision, had devised a system, which the Navy adopted, whereby a drawing or photograph of a plane was flashed on a screen for a fraction of a second and a man learned to recognize the plane in its total aspect. He also used training slides developing eye muscles and increasing the range of vision both up and down and sidewise. After some months of training, men could recognize American, British, German, and Japanese planes in 1/100 of a second,



EASY TO SPOT A BATTLEWAGON
The *Iowa* has long forward taper and rounded stern, with square turrets sporting triple rifles. The *Alaska* has typical cruiser lines. CVE and DD's are in background.

even in a reduced light; untrained persons could see only a blur or nothing at all. Ships could be recognized in a second.

The technique of recognizing the planes and ships instantly was not simply a vaudeville stunt. Pilots returning from the battle front have reported that on their first few sorties, though they had been in action before, they had not been able to recognize planes. It had taken several sorties to train their eyes to instant recognition.

One even admitted frankly, "I didn't fire until I got so close I could see the German crosses on the wings and the fuselage of the aircraft because I had already bounced so many P-51's that I wanted to make sure."

Complete reliance on insignia was the most dangerous way to recognize, and this frank confession from an experienced fighter indicates that recognition is one of the toughest and most important activities of aerial combat.

It could be fatal to be careless. As late as 1944 the pilot of a B-25 Mitchell, one of the most familiar Army planes in the Pacific, spotted two torpedo boats below him. Not recognizing them as American PT's, he came down on them and strafed them with the full weight of eight .50-caliber machine guns. They, in turn, opened up on him. While the first PT was still sinking, a patrolling Navy fighter happened along, swung in on the bomber, and shot it down. The bomber pilot never lived to make an explanation, nor did all of the PT men.

Application of Total Form

If there is a war on, it is not enough to take a good look at an airplane when it is near to you to recognize it. Here is why. In an aerial combat the man who first decides to press home the attack has the best chance of making the kill. This is even more true today because of the new high speed of planes and of the limited ranges preventing protracted combat. If you are going to shoot, you shoot fast. Uncertainty leading to hesitation may prove fatal to you if the plane turns out to be enemy. The uncertainty which leads to shooting first and recognizing second may kill more of your friends than your enemies.

Since you can gain the advantage on your opponent by recognizing him first, you must learn to recognize him at the greatest possible distance. You will then be able to use the brief time of closure to get him in your sights or to identify yourself as his friend. In terms of recognition this means that you must know as intimately as your own all the planes that you encounter.

And how are you going to do that? You should begin by knowing one at a time. The best way to become acquainted with any plane is to go out to a field and look at it. But if the plane is not available, photographs of the plane from various angles make good substitutes. From them you will be able to acquire an undistorted picture of the plane's total form. After it is firmly printed on the tablets of your memory, you will gain an easy familiarity with the details which go to make up the total form. Constant review is a must if one wishes to become an expert. A good habit is to look at every plane that flies overhead and to watch it as it varies in appearance because of changes in distances and angles of vision.

IDENTIFICATION FRIEND OR FOE

Dangers of Loose Flying Tactics During War

If you were commanding officer of a battleship during wartime and saw what you were sure was an F6F Hellcat flying directly toward you after completing an important and dangerous mission, what would you do? The answer is this: If the F6F pilot did not identify himself by the time he had flown to within 12,000 yards, you would give orders to your gunners to shoot him down. As commanding officer of a BB costing more than $100,000,000 with more than 2,000 officers and men on board, you cannot afford to run the risk of allowing an enemy flying a captured American plane to make an attack on you.

To put the matter briefly, Identification Friend or Foe (IFF) is as important as recognition. Early in the war the tendency was to stress recognition, for obvious reasons. To the man on the attack, whether he is in a plane, ship, or tank, recognition is of supreme importance. It can keep his conscience clear of the dreadful knowledge that he has killed a friend. It can assure him of a split-second advantage in getting the enemy in his sights. It can stretch out his possibility of victory to the greatest possible extent.

But if he is to save his own life, not to mention his equipment, he must clearly identify himself to all friendly combatants.

Proper and Improper Procedures During War

The proper use of identification is particularly important to airmen and submarine men. With the great speeds of modern warplanes, a flier can reach a potential attacking position before shipboard or ground-force gunners can recognize him surely.

Consider too the psychology of gunners and what makes them so quick to put their guns into action. They have been confined in a small area for days, weeks, or months. They have been practicing morning, noon, and night and are proud of their marksmanship. They may have been frequently strafed or bombed. Because they have no defense but their guns, they are understandably fast on the trigger.

Unless a pilot behaves in a friendly fashion and makes himself known at once, he may find himself the target of a large warship's full battery of AA guns.

After a pilot has completed his mission, he feels an urge to return to his ship by the shortest way possible. He is a menace unless he is familiar with the identification procedure in his combat area and how to use it. He must know the extents and limits of his IFF (electronic equipment) and use it at the prescribed times and must employ the proper channel for the area of situation. He must follow the prescribed routes or methods of approach. He must volunteer correct identification signals and respond to challenge immediately and correctly. Above all, he must use his common sense. Some American fliers were shot down by their own gunners on their own carriers because after shooting down Japs in an admirable display of cool alertness they just forgot to turn on their IFF on the return trip.

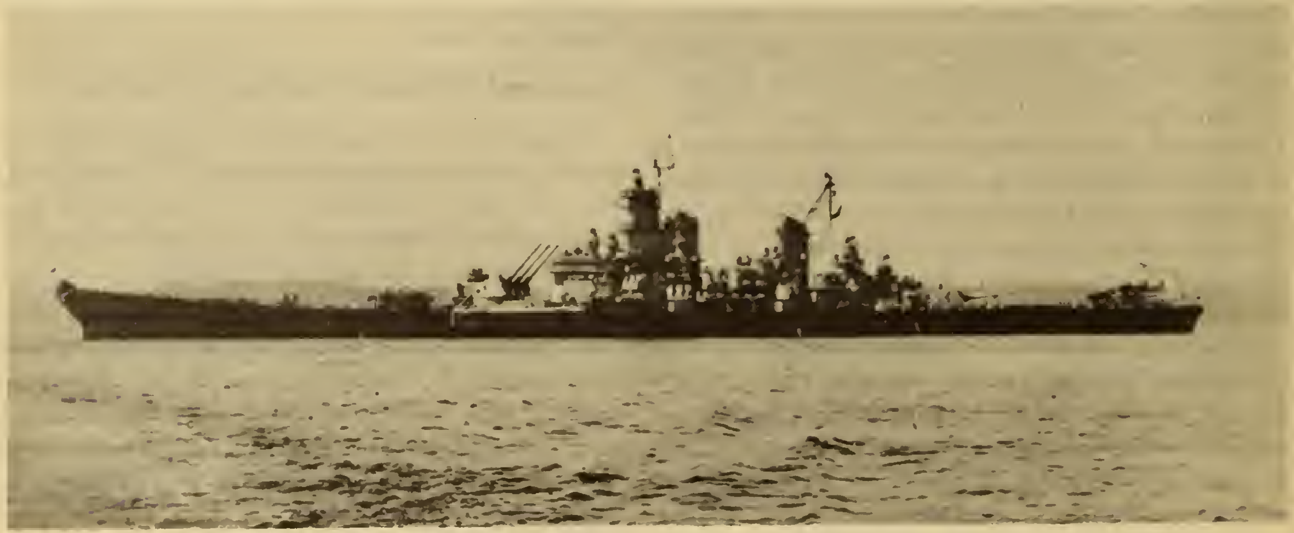
No matter how brilliant a flier's record, he has not the right to be so conceited as to assume that he has been recognized. It is up to him to make his identification at the prescribed distance and location. It is up to him to be sure that his signals have been received. Bad visibility may prevent the ship or shore station from seeing his visual signals. Jamming, static, or conflicting radio use may disrupt interphone communications. Enemy commanders may try to fake an answer.

RECOGNITION OF SHIPS BY TYPES

Battleships

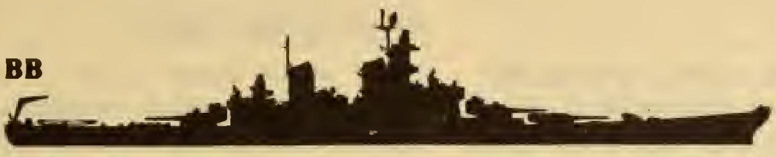
Our best battleships, the four units of the *Iowa* class, are beautiful, long (887 feet), and streamlined. Their low superstructure makes them seem to ride low in the water. The bridge structure and fire control towers are conical in shape, a national characteristic. Striking and individual is the long and narrow bow with its upsweep and tapered stern. The disposition of rifles, three in number, in two turrets forward and one aft is typically American.

In sharp contrast to American stylized modernity, British warships, even those of their best and most recent class which also has four units, are more angular in appearance, boxier, squarish, and practical. The bridge is a flatsided and upright blockhouse. Different from any American arrangement in main batteries, this class of battleship has two turrets forward, one with quadruple rifles and one with twin, and one turret aft with quadruple.



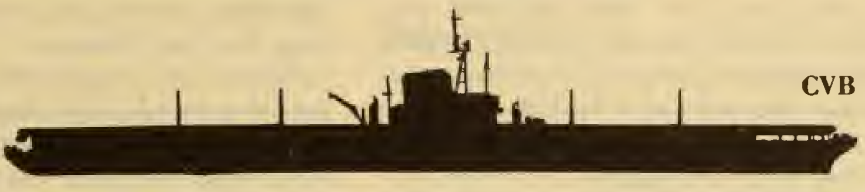
BATTLESHIP: SINGLE PYRAMID TOPPED WITH LIGHTHOUSE TOWER
These are characteristics of the *Iowa*-class battleships. Shown here is the powerful *New Jersey*.

BB



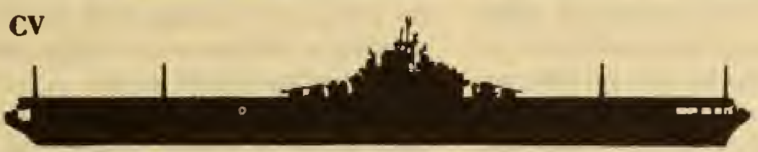
IOWA Class

CVB



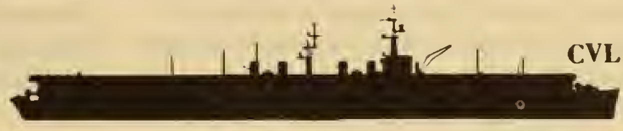
MIDWAY Class

CV



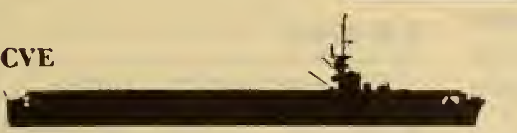
ESSEX Class

CVL



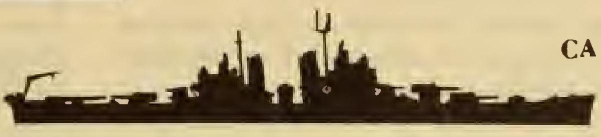
SAIPAN Class

CVE



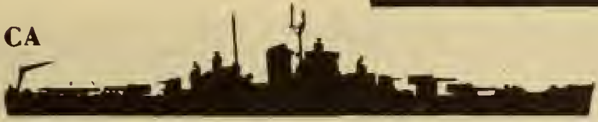
COMMENCEMENT BAY Class

CA



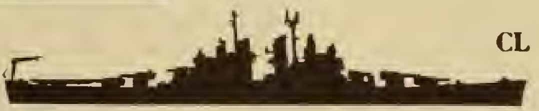
BALTIMORE Class

CA



OREGON CITY Class

CL

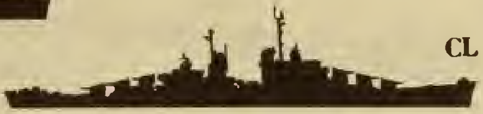


CLEVELAND Class

CL

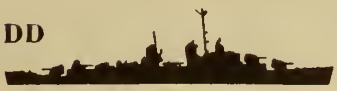
FARGO Class

CL



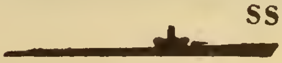
SAN DIEGO-OAKLAND Class

DD



SUMNER Class (short hull)

SS



BALAO Class

SHIP SILHOUETTES

Aircraft Carriers

The largest aircraft carriers afloat today, the *Midway* CVB and her sister ships, the *Franklin D. Roosevelt* and the *Coral Sea,* represent the culmination of American aircraft carrier design development. The chief recognition point is the clean flight deck, a result of the *Midway's* size that permitted the relocation of all heavy antiaircraft guns on a continuous sponson along either side, well below the flight deck level. Another recognition point is the huge stack, which reflects the powerful propelling plant.

The standard fleet carriers of World War II, called the *Essex* class CV may be distinguished from the *Midway* by the pyramidal shape of the superstructure caused by the position of the main battery on either side of the island. The stack is smaller in size and more concealed, with a light tripod mast beside it. Other recognition points are the squarer bow and stern and the flight deck overhang at the bow.

The light aircraft carriers, the *Saipan* and *Independence* classes (CVL), are easy to spot because they have four separate stacks venting boiler fumes and angling out from the starboard side and projecting just above the level of the flight deck.

Escort carriers (CVE) have oblong flight decks and small, square islands located forward of amidships on the starboard side.

Heavy and Light Cruisers

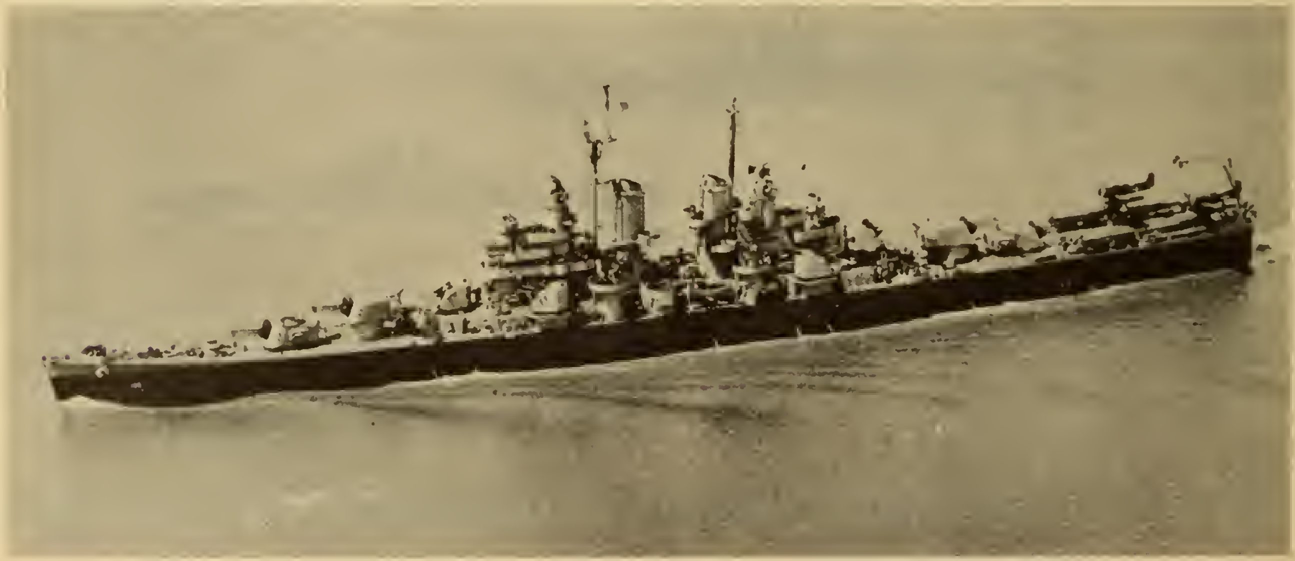
One of our easiest cruisers to recognize is the 27,500-ton *Alaska,* which, mounting nine 12-inch guns, is rated as a large cruiser or CB. The single stack has a peculiar horn shape, an easy feature to recognize from many angles. Long as some battleships, it has a clean bow and afterdecks.

Another new cruiser built during World War II, the *Baltimore* CA, is in keeping with the main impression given by American cruisers, which is one of leanness and rakishness. The superstructure tending to be cornucopia in shape rises in two clusters but is compact in relation to the ship's length. The funnels are raked slightly and capped.

Since World War II, American naval architects have shown a marked tendency to build one-stack cruisers, both heavy and light, as shown by the *Oregon*-class CA and the *Fargo*-class CL supplementing the *Baltimore* CA and the *Cleveland* CL, both two-stackers.

Submarines

The greatest unlicked problem of World War II in recognition was that of the submarine. Navies and air forces operated under the policy of "If you see an unidentified sub outside a sub sanctuary, sink it." Unless the position of friendly submarines was known exactly



A SPLIT PYRAMID USUALLY INDICATES A CRUISER
The *Cleveland*-class light cruisers conform to the general rule for identification of cruisers.

or unless they could identify themselves immediately, the patrol boat or plane had no recourse but to depth-charge or bomb.

Experts in recognition in an attempt to simplify a difficult problem found that the most reliable means of recognizing American as opposed to Japanese submarines was to memorize the shapes and positions of conning towers.

The American fleet-type submarine has a conning tower well forward of amidships, but the conning towers of all known Japanese submarines were almost squarely amidships. The American conning tower has low AA steps fore and aft and a low center section out of which rise the tall, close-set, and very heavy periscope shears, a unique feature. When seen at a distance, they give a pronounced triangular appearance to the tower.

In contrast with American, Japanese conning towers were large and bulky without periscope shears and without AA steps. From a distance Japanese conning towers appeared as rectangles or mounds.

American naval aviators found, however, that it was one thing to look at pictures and that it was another to try to recognize the nationality of a submarine awash on the surface of the Pacific with sea running and fog making everything hazy.

Time and time again reports of near-sinkings of our own subs came in to headquarters. A classic example occurred in the Pacific during the Battle of Midway when a group of B-17 Flying Fortresses spotted what was believed to be a Japanese cruiser. After dropping all their bombs, they reported at headquarters that they had sunk the Japanese cruiser in 15 seconds. The ship turned out to be an American submarine which had crash-dived to escape annihilation that came all too close.

Destroyers

Difficult to recognize by types but most frequently seen of all warships are destroyers. The mainstay of the United States destroyer fleet in World War II, the *Sumner* and *Fletcher* classes, have as one of their most important recognition points flush-deck hulls.

Stacks of American DD's constructed during World War II are broad and separated, their lines broken by searchlight platforms and control stations, which are in contrast to the DD's built before with their narrow stacks and higher pyramidal outlines.

Because the bridge is set well forward, destroyers show a long and flattened silhouette aft. They ride lower in the water than most other combatant ships of similar size or larger.

Merchant Ships

Because merchant ships in war move supplies close to battle fronts and advanced bases, they are vital in the prosecution of a war and ought to be recognized in terms of type, size, and probable cargo. Enemy merchant ships are especially important to identify because they give information badly needed about the enemy's logistic plans. Because they look so much alike in all nations, they present an even greater recognition problem than combatant ships.

Nevertheless they can be broken down into three main divisions. For each of the three essential functions of merchant ships — the transportation of passengers, freight, or bulk cargo — a particular type different in recognition points from the others has been developed.

Passenger ships can be identified by their large consolidated superstructure amidships made up of one or more decks or living floors for the accommodation of passengers. Promenade decks about this superstructure are clearly visible. Many portholes indicate living space below deck.

Cargo carriers may be distinguished from passenger ships by the large number of kingposts (short vertical posts used to support derrick booms) and smaller superstructures.

Freighters usually carry a large amount of loading equipment in the form of heavy masts, kingposts, and booms to handle cargo. Engines are usually placed amidships; and stacks, bridges, and other elements of the superstructure are located in a roughly central position.

Cargo vessels carrying bulk loads like grain, ore, coal, and oil look different from other freighters because engines and machinery are located aft. Their superstructure is smaller and is located either forward or amidship. The holds extend from bow to stern without interruption.

The main key to *tankers,* most frequently seen and most important, is that they have their funnels far aft.

JMST System in World War II

The United States Navy had difficulty for a long time in trying to recognize Japanese merchant ships, though it realized early that they should be given a high priority rating. The reason for the Navy's concern is easy to understand. Japan's vast empire, based on her conquests, was held together mostly by sea lanes. Hence all major supplies and reinforcements had to move to the front in tankers, transports, or freighters. Equally vital was maritime traffic going to Japan. Japanese industry was concentrated in Manchuria and Japan, but key raw materials, like oil, rubber, tin, and bauxite, had to be shipped from Malaya and the East Indies.

To enable our naval airmen to make intelligible comments about Japanese merchant shipping, recognition experts worked out a neat and simple system known as JMST (Japanese Merchant Shipping Tonnage), which insured accurate reports about types, tonnages, and speeds of Japanese cargo vessels.

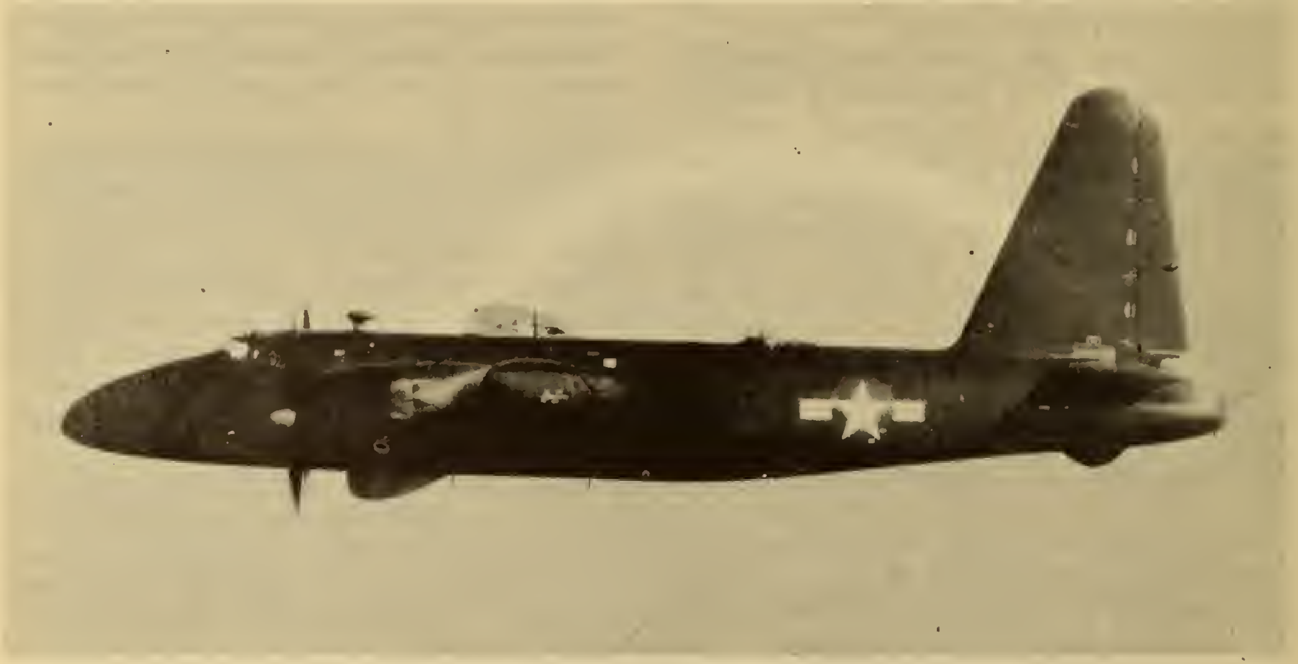
PRINCIPLES OF PLANE RECOGNITION

National Differences

"How do you tell Jap planes from American? They all look alike to me. And how can a pilot flying a pursuit plane at 400 miles an hour recognize another pursuit plane flying toward him at 400 miles an hour?" Such questions were heard many thousands of times during World War II.

One may as well admit that aircraft recognition is difficult and that it takes long experience to be able to be sure in combat when to fire and when not. But it can be done.

One becomes conscious first that there are national differences. American planes are streamlined, but rugged marvels of mechanical art. British bombers tend to be boxlike, practical, square, and solid—"flying trucks." Japanese planes were slender, fragile, maneuverable, and graceful. Many German planes were ugly and often appeared like monstrous insects.



A P2V NEPTUNE, NAVY LAND-BASED PATROL BOMBER
The P2V is easily identified by the fish-head nose, fin, and rudder.

The Stuka divebomber, for example, was particularly repulsive in appearance.

A Navy man must put in many months of intensive study and training before he is able to recognize accurately and instantaneously fighting planes in action. Veteran Navy fliers could spot Jap planes so far away that they were only small objects in the sky. They could trust their intuition which would not betray them because they had made so many thousands of correct judgments already.

"Jap planes looked different from ours and acted different," Navy men with experience used to say. "See for yourself. Jap noses are shorter; their wings are set lower; their fuselages are slenderer and trimmer." And then warming up to his subject, they would go on, "How can you possibly confuse Jap planes with American? Ours have more armor protection and so look heavier and bulkier. They are more complex in appearance. Wings and tails have much more angularity."

Zekes versus Hellcats

Navy fliers could recognize a Zeke as opposed to a Hellcat because a Zeke had a bubble-type canopy, bell-shaped fin, and a rudder with the trailing edge forming a point with the aft end of the fuselage. And they could recognize a Hellcat because of the stocky fuselage and the squared-off airfoil surfaces.

IDENTIFICATION AND INTELLIGENCE

Recognition Now Has a Wider Meaning

At the end of the war recognition was admittedly more than the business of being able to spot 150 or more different kinds of planes and ships. Recognition became also an intelligence weapon. Such an attitude was a result of education and experience, for in the beginning a combat man considered (and rightly) his first job to be fighting. A fighter pilot flying on operations had a big complicated machine to handle. He always had to keep his eyes alert for enemy activity. When he saw a plane in the distance, he had to turn to investigate it, at the same time estimating range, calculating speed, and preparing to shoot it down if it proved to be an enemy. When he closed in rapidly, all he wanted to know was: Is it friendly or enemy? When he had made that decision he was ready to open fire. The determination of type and model was secondary. If he shot down his foe, he won his personal battle.

The Navy found itself less and less able to accept this thesis, however, when the war got fiercer and more complicated. For when a fighter pilot took the attitude that he was only a fighter man out to get the enemy and get his own plane back, he was likely to sacrifice over-all strategy for immediate tactics. Though it was important of course to destroy individual enemy planes, in greater battles it was still more important to know where the enemy was and what equipment he had.

If an Oscar or a Sally was spotted, for example, an intelligence officer knew that they were Army planes flown from an Army base, and that made a strategical difference. The same logic held if a Zeke or a Betty were spotted — they were Navy planes involving perhaps a carrier task force working in harmony with land-based planes, and such a situation had an entirely different strategical significance.

In the early days of the Philippine campaign numerous Oscars were shot down. Later study proved that many of them were the new and highly effective Frank in the 400-mile-an-hour class. Though our losses were not extreme, they could have been less if our men had been prepared to meet this formidable competitor. The pilots weak in recognition who reported Oscars did their fellows a disservice.

It is unfair, however, to single out fighter pilots. His co-combatants on land and sea made the same sorts of errors in the heat of battle. And they also robbed intelligence of much significant information. Many weapons were needed to beat the Japanese to their knees. Recognition and intelligence working together were one of the most vital.

A B-29 Raid to Japan

If we follow the bombing paths of B-29's in July 1945 on their almost daily 3,200-mile flights from the Marianas to Japan, we can understand quite well what role recognition played when it worked closely with intelligence.

Curiously enough, although the B-29 was probably the ultimate in land-based air power for World War II, all of the huge bombers' missions were over water. Thus the Army and Navy were working in close cooperation.

Northward the route was thick with United States convoys supplying the strong points of our front across the Volcanoes and Ryukyus. Occasionally a carrier task force could be seen spread out far below. Besides the bombers and flying boats on search or air-sea rescue patrol, Superforts would pass transport planes carrying personnel and high-priority cargo into Iwo and Okinawa.

As the Superforts entered the ocean areas near Japan, their crews took notes on enemy ships, both naval and merchant, to fill in the complicated pattern of reconnaissance and intelligence on Japanese maritime activity. The Superforts did not attack enemy ships or circle for a better look; they had a more important mission and kept steadily on course and speed. At this time observers had to be proficient in high-altitude ship recognition because what they were seeing was hull shapes.

Nearing the Japanese coast, the Superforts began their slow and arduous climb to their daylight bombing altitude of 16,000 to 19,000 feet. As they pushed upward, the sea below filled up with coastal shipping.

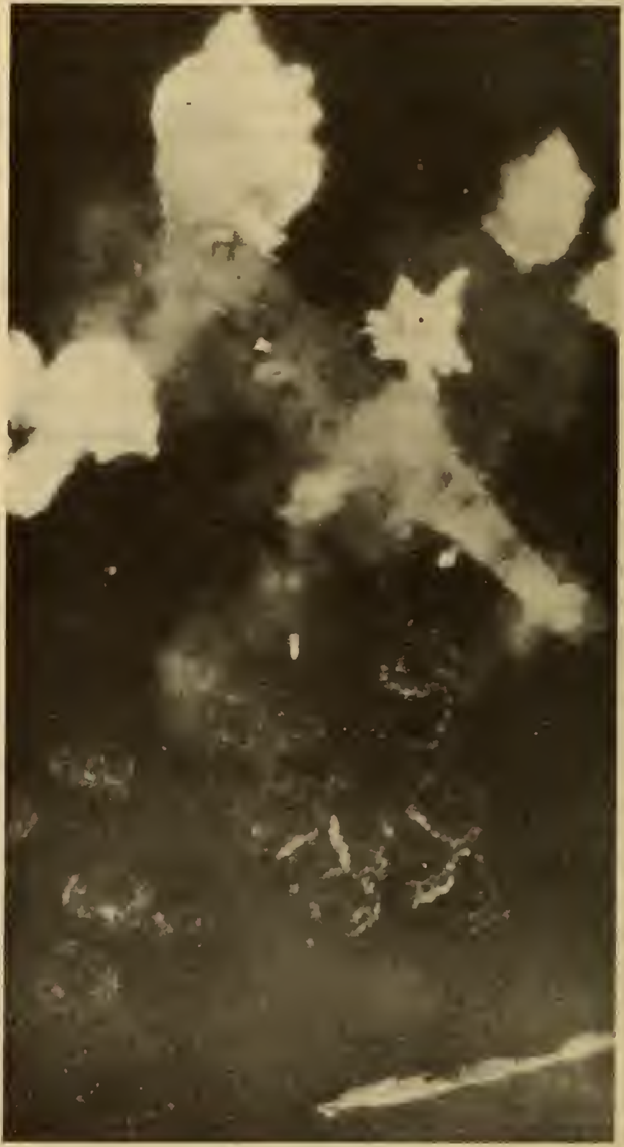
At the shoreline, the emphasis in ship recognition switched from merchant to naval. The surviving heavy units of the Japanese fleet skulked in their harbors often under thick and elaborate camouflage. As the Superforts moved inward, their crews scanned anchorages for any change in position, for any suspicious concentration.

At this point the excitement increased and the gunners prepared for battle. The escorting fighters from Iwo Jima had just put in their appearance and taken up their positions around the bomber boxes.

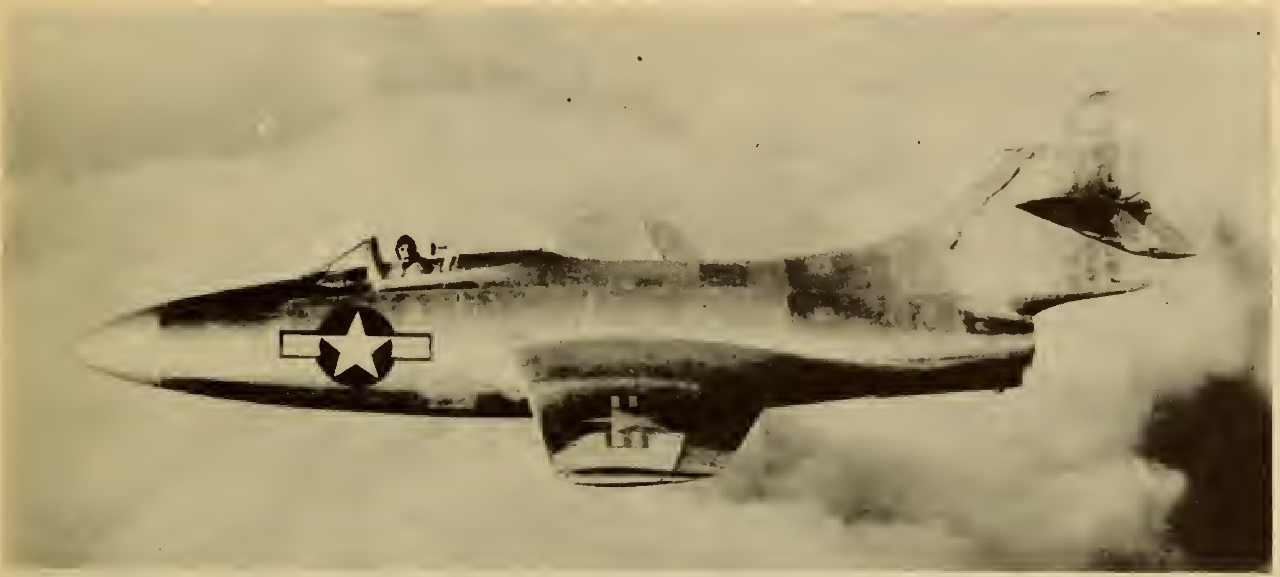
Now the Japanese snooper fighters began to buzz around. From here on in, as Jap fighter opposition mounted, the B-29 crews were faced with combat recognition instead of observation for intelligence.

By the time the Superforts found themselves over the target, Osaka, Japanese fighter opposition had reached its peak of fury, daring, and skill. The Japs threw in everything they had with do-and-die spirit.

It was a strain for gunners even if they knew their recognition (but a worse strain if they did not), for



BOMB HURTLES DOWN ON DOOMED JAP CARRIER
Properly identified as Japanese by forward taper of flight deck, this CV has already been straddled by near hits.



THE PANTHER—A JET FIGHTER
The Panther is capable of normal operation from a carrier. Its speed is about 600 miles an hour.

Mustangs, concerned more with screening the bombers than with destroying fighter opposition, flew close to the B-29's. Waist gunners, tail and nose gunners had to decide in split seconds at whom to shoot; they had also to recognize and report all of the attacking Japanese. Should there have been new and faster planes, the Mustangs, warned by intelligence, would revise their escort procedure.

Gunners also had to be quick to spot freak weapons, like rockets, flying bombs, and balls of fire, as well as new fighter designs.

After the bomber runs, the Japanese fliers, desperate because of the damage done to their cities, kept on boring in to the attack as the Superforts turned back to the coast. But, dejected, they turned back when the Superforts got well out over the ocean—unless there was a chance to attack a crippled American. The Mustangs streaked back to their landing fields on Iwo Jima, and the bombers gradually let down to low altitudes on the long run home.

Thus recognition and intelligence officers played their useful role in making easier for the Superfortresses the systematic destruction of Japanese industry.

Possible Trends in Planes of the Future

It is safe to prophesy that the planes of the future will look as different from the planes of World War II as the planes of World War II did from those of World War I. New models are developing so rapidly that one can predict the nature of changes only in very general terms.

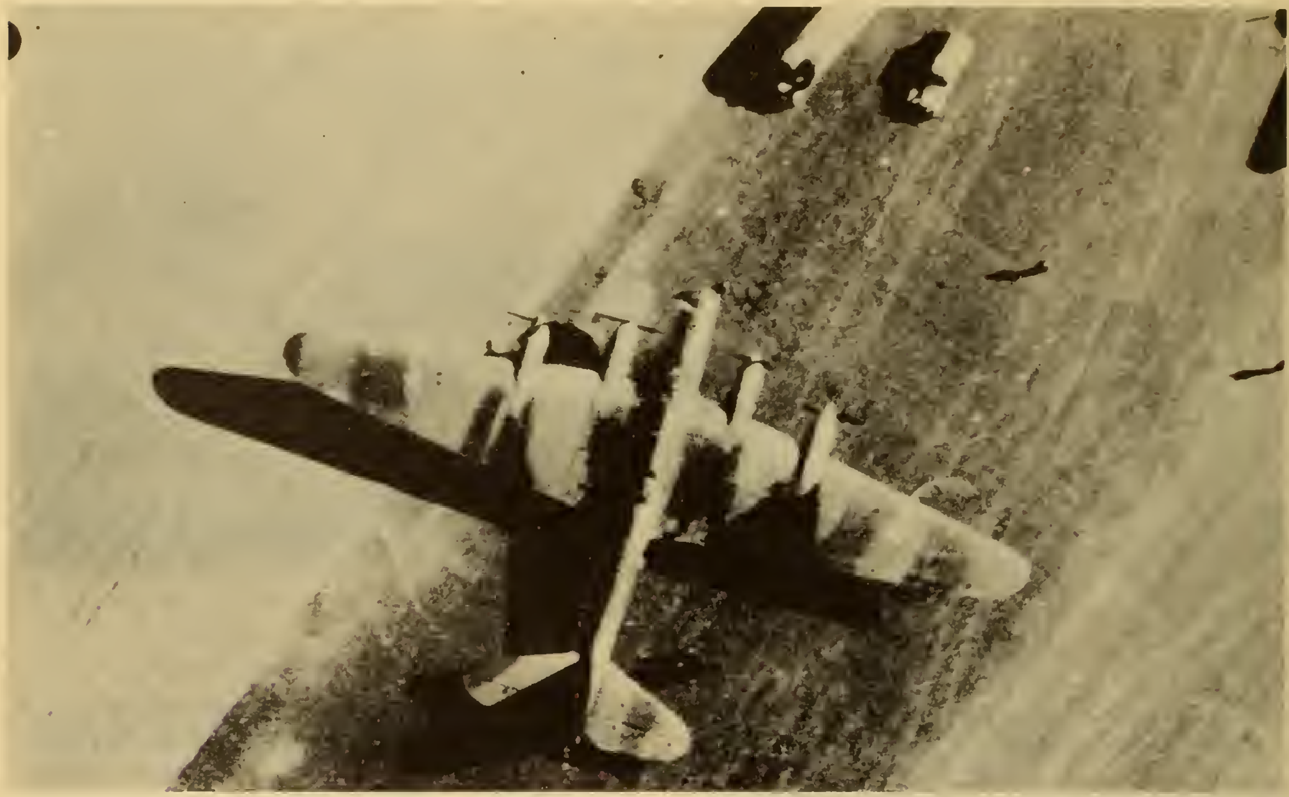
Planes of the future will probably show longer fuselages, longer noses, and wings that are short, stubby, and swept back, with edges so thin as to be called knife-edged.

"Greenhouses" will probably move farther forward on fuselages and often be found in the nose. Fairings will be sleeker. The positions and shapes of jet protuberances will serve as important recognition points.

RECOGNITION AND THE RUSSIAN AIR FORCE

Russians Have a Long Aviation History

Though numbers and types of Russian planes operating behind the Iron Curtain are unknown, nevertheless the high quality is certain. The airmindedness



TYPICAL RUSSIAN PLANE OF WORLD WAR II
Note the enormous wing area and slender fuselage peculiar to Soviet aircraft.

of the Soviets, the high degree of technical skill, and the intelligence philosophy of aerial warfare which determined the organization of their Army and Navy and the types of planes needed have resulted in undoubted excellence.

On lend-lease during World War II the Russians received many thousands of American planes especially favored for low-level attacks, and there was no trouble in recognizing them even with Russian markings: P-39 Airacobras, P-40 Hawks, P-51 Mustangs, A-20 Bostons, and B-25 Mitchells.

As for Russian planes themselves, just as any man with an eye for automobiles can tell a British from an American car though he may not be able to name it, so American aviators could tell a Russian from an American plane.

The appearance of Russian planes was determined by national problems in geography and economics. That is to say, Russian strategists saw that they would have to establish state factories throughout the Soviet Union and assign to each the manufacture of those items capable of being produced from the raw materials near which the factory was located. In other words, anticipating the German mass attack, Russian strategists astutely took advantage of their vast land masses and decentralized to an extreme degree their productive facilities.

In terms of recognition this meant that Russian planes would have a straightforward, rugged, and conventional appearance. If simply enough designed, planes could still be adequately serviced, despite inadequate tools and facilities and despite the lack of elaborate installations, big hangars, and permanent fixtures. Small and compact, Russian planes could be and were repaired in pastures and camouflaged in farmland thickets with birch branches while officers and men were billeted in neighboring villages and on farms.

It would have been a mistake to attempt to recognize Russian planes by their camouflage scheme: grey on the upper surfaces and pale blue underneath. Five-point yellow stars, bordered in white, replaced the red stars found on noncamouflaged aircraft. Squadron symbols were painted on the fuselage and tail fin.

The Future in Russian Aviation

Owing to the rapidity of aviation development in Russia, one can only point to certain fairly definite trends as they will affect the recognition of Soviet planes.

Some of our B-29 Superfortresses were forced to land in Russia during the past war, and they were confiscated and copied. The Russian version is now believed to be in mass production.

Numbers of Nazi aviation experts from former German territories are influencing Russian design with the result that Russian planes may show some German characteristics.

The heavier and older types of Russian aircraft will be eliminated in favor of planes with increased horsepower in small power plants. There will be probable further development of plywood aircraft in the search for a lower weight-strength ratio.

New heavy bombers for high-altitude and long-range operations will be seen. American successes in strategic bombing of Germany and Japan made a profound impression in Russia. Least vulnerable to strategic bombing herself, Russia cannot afford to overlook the vulnerability of possible enemies. The new bombers may have power-driven turrets, heretofore unused, and probably an extremely efficient 20-mm remote-controlled turret.

A heavy production of jet-propelled and rocket-propelled aircraft of both Russian and German design is underway. Reports in 1948 from behind the Iron Curtain indicated that the Russians already had a four-jet bomber type and a two-jet bomber type in operation. The only noteworthy bomber produced by Russia during World War II was the twin-engine TU-2, and the chief reason may be that the Russians found our A-20 Bostons and B-25 Mitchells adequate for the tasks to be performed.

CHAPTER 17

CARRIER WARFARE

Part I—The Fast Carrier Task Force

INTRODUCTION

General

As developed in World War II, the fast carrier task force represents a revolution in naval war, a more complete revolution than resulted from the invention of the submarine or torpedo. To an extent almost beyond belief, present-day naval warfare is unlike that of World War I and wars preceding. And in large measure, the new pattern of sea warfare has been the product of American ingenuity and initiative, in response to the compulsion of geographic facts quite unlike those which belligerents in earlier wars faced. Naval warfare today is to a considerable extent air warfare, based on and built around aircraft carriers. Yet it continues to conform to the unchanging principles of sea war, as they have developed through the centuries.

Amphibious operations, discussed in a later chapter, are primarily naval operations devised to make landings on hostile shores. The carrier task force, completely American in concept and use, and deriving from the unique position of the United States with reference to the war in the Pacific, is designed to gain and hold command of the broad seas. It is the weapon which sets the stage for amphibious warfare, creating the "area of immunity" in which the amphibious force performs its mission. The carrier task force and the amphibious force were the warp and woof of the Navy's war effort.

Background of the Carrier Task Force

To wage war in the immense spaces of the Pacific, the United States built a fleet unlike any previous fleet in history. It devised its own strategems, shaped its own tactics. Both were cut to fit the contours of an unprecedented geographic situation, and to utilize the weapons born of a new technology. Carrier war began with World War II. We did not move from the age of gun-firing surface ships into an age of air power pure and simple. We went into an age in which sea power and air power were combined—a trend accentuated by the historic chance that made the Pacific (for the first time in history) the theater of a vast armed struggle.

This new pattern of naval war — *oceanic* war as we might call it — was foreshadowed some years earlier, when the Navy began to build aircraft carriers and to develop a powerful, efficient air organization, primarily of carrier-based planes. In the late 1920's, when the *Lexington* and *Saratoga* were completed as giant carriers, the basic pattern of our recent war in the Pacific was already indicated. The Navy in the intervening years never abandoned its farsighted concept of the pattern which naval war would take. The American fleet as a whole was designed for the world's largest ocean, including such factors as the steaming radius of its battleships, cruisers, and submarines. Fueling at sea, a necessary logistical feature of war in great

SAIPAN BOARD OF STRATEGY
High-ranking Navy and Marine Corps officers discuss details of the operations at Saipan during the battle for that Marianas stronghold.

oceanic spaces, was developed as a distinctive aspect of American naval practice. But the dominant fact was the development of aircraft carriers — no less significant because we had built only seven of them by the time war came.

If anyone had doubts about the main role of the aircraft carrier in the new pattern of sea war, he found the answer on 7 December 1941 when the Japanese used carrier-borne aircraft for their successful attack on our battleship force at Pearl Harbor. That assault not only demonstrated the possibilities of carrier warfare, but also forced the United States to turn to carriers. For in terms of striking power, we had nothing left in the Pacific but carriers and cruisers.

Forced to the defensive, the Navy nevertheless maintained the offensive spirit by ingenious and daring use of its few carriers and supporting craft. These ships, which had to be spread thin, were grouped in *task forces*. The general notion of the naval task force was an old and familiar one: A group of ships assembled to do a specific job, and possessing the fire power, speed, and defensive characteristics estimated as essential for that job.

Early Use of Carrier Task Forces

From the attack on Pearl Harbor onward, the carrier task force was the primary instrument of naval war in the Pacific. At first, it was usually made up of one or two carriers, two or more heavy cruisers, and a small screen of destroyers. When Admiral W. F. Halsey raided Wake Island late in February 1942, for example, he took the carrier *Enterprise*, two cruisers, and seven destroyers. A week later, the same force raided Marcus Island. His early raids on the Gilberts and Marshalls were made with two carriers, *Enterprise* and *Yorktown*, supported by five cruisers and ten destroyers. In March of 1942, the raid on Salamaua and Lae was carried out by the *Lexington* and *Yorktown* and supporting ships.

Such were the slender task forces of the months immediately following the Pearl Harbor attack, before we had carriers in numbers or any battleships at all. At best, such a force had 175 aircraft of all types; and in practice only about half this number could strike an objective. These task forces could take no reckless chances of encountering the vastly superior Japanese fleet. They made hit-and-run raids on the outposts of Japanese power and a single defiant gesture against Tokyo with 16 B-25's off the *Hornet*. Harassing raids and long-distance jousting with the enemy's carrier forces were the only expedients of the fleet in that unhappy period when we had no heavy, armored, gun-firing ships to risk against the enemy's battle line. Yet those harassing operations on the rim of the area under Japanese control were enough to slow the enemy's advance and blunt the spearheads he was aiming at New Caledonia, Australia, and Hawaii.

The most spectacular use of the carrier task force in the early days of the war was in the Battle of Midway, 3 to 6 June 1942. The Japanese were driving toward Hawaii with a great invasion force. This created a historic opportunity for our carrier forces. Although outnumbered in every ship type except submarines, the United States this time had three carriers — *Yorktown*, *Enterprise*, and *Hornet*. It also had 7 heavy cruisers, 1 light cruiser, 14 destroyers, some 20 submarines. Wisely handled, and with superior personnel and equipment, the American force met and turned back the enemy force which was to capture Midway. The battle resulted in the sinking of four Japanese carriers — destruction of the backbone of Japanese naval air. And this changed the whole strategic picture in the Pacific. It enabled the United States to turn from the defensive to a limited form of offensive war. It also enabled our fleet to turn from the enemy's naval air to his land-based air, as the primary target of our carrier task force. But because it lacked battleships, the American force at Midway was not in position to pursue the enemy force, which included four battleships. There was no doubt, however, of the decisive nature of the engagement.

Characteristics of Carrier Task Force

Already, in this early phase of carrier warfare, the special characteristics of the carrier task force as an instrument of naval power were becoming evident. It had a range appropriate for the vast distances of the Pacific, made possible by frequent topping-off of destroyers by the battleships and carriers, and by the refueling of all units at sea from oilers. It had a tactical speed of about 30 knots. With such range and speed, the task force was highly mobile. It could strike in the Solomons one week and the Marshalls the next.

With mobility goes surprise — a factor of particular importance for the power obliged to admit inferiority in heavy-gun ships. It was a temporary inferiority, fortunately; but it was to be a long time before the United States Fleet would roam the whole Pacific without fear of meeting the Jap warships. In good time, of course, it was to steam unhindered in every corner of the ocean, in arduous search of the strongest force the enemy could send out.

The carrier task force also had great flexibility. As the term *task force* implies, it was assembled for a specific mission, and was given the components to do its particular job, within the limits of the ships that were available. There was flexibility in the choice of ships, in the over-all strength of the force, and in the types of aircraft and their armament.

In forming an appraisal of the carrier task force, one must remember that the aircraft carrier was for all practical purposes a completely new weapon in 1941. Except for occasional forays under great handicaps, some ferrying work, and one brilliant operation at Taranto, the British made no major use of their carriers. The geography of Europe did not encourage them, for every objective lay within the orbit of the enemy's land-based air. The United States Fleet had its own experience and doctrine developed in fleet problems over 18 years to guide it in the use of carriers and their aircraft. In the uphill months of 1942 and 1943, our carrier forces learned how to make use of cloud cover, how to capitalize on wind and weather and how to use both our own planes and antiaircraft fire for defense.

DEVELOPMENT OF THE FAST CARRIER TASK FORCE

A New Weapon

As the United States Fleet as a whole grew in wartime, the fast carrier task force became an increasingly powerful weapon. New construction sent a steadily growing stream of carriers into the Pacific. Two new types of fast carriers became available: the light carrier, of the *Independence* class, on a cruiser hull, and the *Essex* class. Both made in excess of 30 knots, and the term *fast carrier task force* was used to emphasize the speed of the force, in contrast to the more numerous but slower escort carriers, used for convoy work, for close support of amphibious landings, and for ferrying operations.

The new battleships were added as they became available. The two *North Carolina* class BB's, already commissioned when war came, had some seasoning before assignment to the Pacific.

The first three BB's of the *South Dakota* class were in commission by the spring of 1942 and were sent out at intervals thereafter. These could not match the flank speed of the fast carriers, but were fast enough to fit into the fast carrier task force without changing its essential characteristics. Then came the *Iowa* class battleships with ample speed for the mighty new fleet being created.

From this combination, with additional cruisers and destroyers, there emerged a swift, compact striking force, retaining all the advantages of speed, mobility, and surprise, and yet possessing the fire power and protective armor to stand and slug it out with any enemy force.

This was shown in the Solomons campaign, when the *Washington* and *South Dakota* joined the fast carriers. Their heavy guns, at Savo Island, put an end to Japanese attempts to reinforce their garrison on Guadalcanal. Growing in power month by month, and turning more to the enemy's land-based air as its chief target, the fast carrier task force by the beginning of 1944 had become something wholly different from the small, impromptu carrier task forces of 1942.

It was in fact a powerful fleet, although it remained a task force *within* the fleet — that fleet embracing the invasion forces themselves and the fleet train. In reality, it was a superb surface fleet, but organized about and taking its pattern from the carriers rather than the heavy gunned ships. The carriers were the primary offensive weapon, with other ships chiefly in supporting roles. It remained intact, save as ships were sunk or damaged or were sent back for overhaul, and were replaced by others.

VICTORY AGAINST FLAME AND EXPLOSION
USS *Bunker Hill*, attacked by suicide planes, valiantly fights the fires and returns to the battle.

Composition of the Fast Carrier Task Force

In 1944 and 1945, the fast carrier task force was a gigantic force in size and power. Typically, it was made up of 15 carriers (CV's and CVL's), 6 to 8 fast battleships, a dozen cruisers, and perhaps 75 destroyers. In this period, the large cruisers of the *Alaska* class were added. Except for the *Enterprise*, and for a limited time the *Saratoga*, all the carriers in these final years of the war were of the *Independence* class (CVL) and the *Essex* class (CV).

Slower ships such as old battleships and cruisers were assigned to the amphibious forces, where the tactical speed was determined by that of transports and other amphibious types.

With 15 or 16 carriers, the fast carrier task force normally had more than 1,000 operational aircraft, with pilots and aircrews, repair facilities, and personnel for maintenance. It was in fact a gigantic air base

USS *INDEPENDENCE* (CVL22)
The *Independence* is one of the carriers that struck repeatedly at the Jap fleet.

afloat and capable of far-flung operations for long periods of time.

Logistic Support

Although not exactly a part of the fast carrier task force, its train of oilers, ammunition and supply ships, and their escort vessels were essential to the fast carrier force. Plodding between the carrier force and various bases, this train brought out to rendezvous points an endless supply of black and diesel oil and gasoline, dry provisions, bombs and shells, and many miscellaneous items, including mail. Escort carriers covering the fueling force brought up replacement planes and pilots. Although lacking in glamor and rarely in the news, this service squadron enabled the fast carrier force to replenish all its needs at sea. Without that endurance, the fast carriers could not have given their unrelenting support to landing forces in the difficult operations of the last year of war.

Fueling at sea was a familiar procedure long before the war. The process of provisioning ships at sea developed steadily, and also the transfer of ammunition. By the time the war ended, this logistical support of the fast carrier force had reached such a point that the force could have been maintained at sea continuously. Indeed, off Okinawa in the late stages of the war, many of the ships remained continuously at sea for over three months, the majority of which time they were either in combat or in the combat area on alert.

The United States was a long way from its enemies in World War II. Logistics consequently was a major problem. For the fast carrier task force, the problem was solved in such a way as to insure the maximum effectiveness of this naval arm and to make carrier forces a major weapon for any future war of global scope.

Task Group

Normally, the fast carrier task force, as it operated in World War II, was deployed in three to five *task groups*, for so vast a fleet could not well be maneuvered in one tactical unit. Each task group was commanded by a rear admiral. From his flagship were sent the signals controlling the movements of all ships in that task group. A typical task group at the latter stages of World War II contained 4 to 5 carriers, 3 battleships, 3 to 7 cruisers, and about 24 destroyers. These figures are merely illustrative, as this number of ships changed frequently because of damage and other causes.

For a time one task group, smaller than the others, was confined to night operations and included two carriers, *Enterprise* and *Independence*, which carried only night fighter aircraft. This task group necessarily steamed on different courses from the rest of the task force and was often out of sight. But all the task groups, as a rule, remained within 10 miles of at least one of the others and within good radiotelephone communication. Even so, the fast carrier force was sometimes spread out over 75 miles of ocean.

FORMATION

General

It might be well at this point to make a few generalizations regarding composition of the carrier task force. It will be seen that it is a flexible weapon, one that can assume any form that the current situation may require.

Task Group Formation

Needless to say, there must be highly developed methods of assembling and operating large numbers of carriers in order to assure flexibility in maneuvering in action, to provide suitable defense formations, and to permit ready and orderly control by the commander. In the carrier task force the principal tactical subdivisions were the task groups, each of which was roughly similar in its composition.

Task group formations were normally of the circular type. In a circular formation, each vessel is assigned a position on a circle at designated bearing and distance from the center of the formation. The aircraft carriers, highly vulnerable to attack, were stationed on the inner circle; on the next circle were stationed the heavy antiaircraft forces, comprised of fast battleships and cruisers. Finally, on the perimeter, were stationed the light vessels, destroyers, with their primary purpose defense against submarines and low-altitude air attack.

This was a normal day or night formation used for cruising and conducting air operations. It also gave protection against submarines and permitted a rapid shift to an air defense formation.

A change in formation might be ordered when heavy air attack was imminent, particularly that of glide or dive bombers, or the kamikaze pilots. Moving the destroyers into positions between the heavy vessels provided the maximum possible gun concentration, although naturally at some sacrifice in submarine protection.

This task group was complete unto itself or it might operate as merely part of the larger task force, comprising two, three, or four such groups.

In the latter case, the individual groups were separated at such a distance as to permit each group to maneuver independently in the operation of its aircraft, in defense against air attack, or in conducting evasive maneuvers against submarines. The normal carrier task force comprised four groups in the late stages of the war in the Pacific. Both the carrier task group and the carrier task force were commanded by naval aviators.

USS *SHANGRI-LA* (CV38)
The numbers on the flight deck are easily visible to returning pilots.

The task group organization gave great flexibility, since one group could be assigned missions of its own. Yet the full benefits of concentration were preserved, and the full strength of the entire task force, 1,000 aircraft or more, could be focused on a major objective when necessary.

Communication within the carrier task force was chiefly by means of flaghoist, flashing light (blinker), and TBS or high-frequency, short-range radiotelephone. During World War II, the last was the standard means of giving routine orders for changes in course, speed, and disposition of ships. Search radar enabled task group commanders and their staffs to see instantly on the flag bridge the positions of the ships under their command, regardless of weather or darkness.

FUNCTIONS AND OPERATION

Command Functions in Carrier War

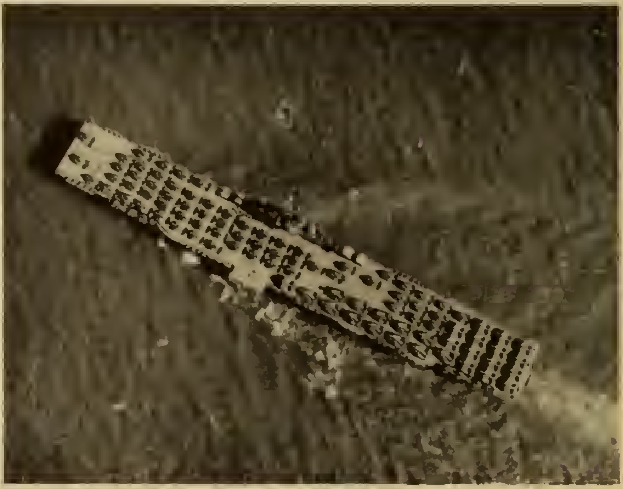
Amphibious forces, service forces, and the fast carrier force together comprised the fleet. The fleet commander, exercising complete command of all forces engaged in an operation, might be with the amphibious forces at the actual time of a landing and might be with the fast carrier task force at other times. Command of the fast carrier task force was lodged in a vice admiral, aboard one of the carriers. In practice, he exercised a wide discretion, within the limits of the operations plan prepared in advance. Task group commanders, subordinate to him, had more limited scope, concerned themselves with detailed decisions as to when to launch aircraft, courses and speeds, and the like. Targets, such as enemy airfields, were assigned in general terms by the task force commander, then parcelled out in detail by task group commanders, and finally assigned individually to pilots by air group and squadron commanders aboard the carriers.

The chain of command, then, descended from the theater commander, usually Commander in Chief, Pacific Fleet, to the Commander Third or Fifth Fleet, to Commander Fast Carrier Task Force, to Commander Task Group, to commanding officers of carriers, to heads of air departments of carriers, to air group commanders, to squadron commanders. Subordinate commanders were encouraged to exercise initiative within the limits of the assigned tasks.

At the various levels of command, a staff was provided for the commander. Typically, this included a chief of staff, operations officer, assistant operations officer, air combat intelligence officer, communications officer, gunnery officer, flag secretary, and flag lieutenant, along with some additional personnel.

Functions of Gun-firing Ships

Numerically, most of the ships of the carrier task force were conventional gun-firing ships — battleships, cruisers, and destroyers. The battleships insured offensive strength to deal with any hostile surface fleet which might be encountered, and also contributed very important antiaircraft protection, mounting a large number of 20-mm, 40-mm, and 5-inch guns. Their aircraft, along with those of the cruisers, provided a valuable seaplane rescue service in addition to their normal duty of controlling fire during shore bombardment. Cruisers, heavy and light, played an important part. They added materially to the antiaircraft protection of the carriers steaming in company. They participated along with battleships and destroyers in occasional bombardment missions.



AERIAL VIEW OF A FAST CARRIER
USS *Boxer* (CV21) with planes of its squadrons spotted on the flight deck.

The destroyers, steaming on the perimeter of the task group formations, were valuable in countless ways. One basic function was antisubmarine protection for the force as a whole. They were at hand to detect and detonate floating mines. They threw up a circular wall of antiaircraft fire which helped immensely, especially against hostile aircraft coming in low on the water for torpedo attacks — the hardest of all to knock down. The destroyers rescued pilots forced down in or near the formation, picked up survivors from damaged ships, transferred mail, personnel, and news copy in an endless water-taxi service.

The antiaircraft batteries of all the ships of a fast carrier task group were unbelievably powerful. The defensive gun installations of the average fast carrier task group late in World War II, comprised a concentration of 236 five-inch, 726 forty-mm and 660 twenty-mm guns. In terms of fire power that meant a capability of 6,000 shells per second, or a total of 200 tons of hot metal per minute.

Fleet Within a Fleet

Considered as a whole, the gun-firing ships in the fast carrier task force were in fact a superb fleet, of orthodox pattern, available for duty as a surface fleet against an enemy force. The battleships, cruisers, and a share of the destroyers constituted a special task force, formed up in fact only for maneuvers but ready on short notice to form and move off to meet an opposing surface fleet. At a moment's time, a balanced, hard-hitting force of gun-firing ships could be brought into being.

This "orthodox" fleet was always there, having its own battle and cruising dispositions, its own signals and communications, and its own tactical doctrines. It also had its own battle plans prepared, on the chance that a major surface action might materialize. Although little used, this "fleet within a fleet" was a strong shield for the vulnerable carriers and amphibious forces, giving them a valuable immunity from attack by enemy surface forces. Just as Great Britain's battle line performed an important service in World War I without very much action, but simply by virtue of being on call at the approaches to the North Sea, so this surface fleet did an important job in the Pacific War. The gun-firing ships added much to the AA protection of the carrier force, lent a hand in shore bombardments and gave the insurance against enemy surface ships which was needed for unhampered carrier operations.

A JAP PLANE GOES DOWN IN FLAMES
This Japanese fighter ran afoul of the guns firing from a carrier.

Relation to Amphibious Forces

The Pacific war was in great part amphibious war. And the spotlight was on the amphibious landings. It is important to see what part the fast carrier force played. It was not present at those landings. It was 20 or 50 or 100 or even 500 miles away. It was in *strategic* relationship to the amphibious force, not in *tactical* relationship.

Before an amphibious landing on a hostile beach, perhaps a week or two in advance, the fast carriers began their work. They moved in to points 50 or 75 miles from the objective and sent waves of aircraft in to bomb and strafe the airfields of the enemy. They did this for the airfields in a vast circle around the objective. They struck at enemy merchant shipping in harbors for 500 miles around the positions marked out for assault. In other words, the fast carriers served as a *strategic screen* for the highly vulnerable, slow-moving vessels of the amphibious forces. They put themselves in between the cumbersome amphibious units and the enemy's strongest air or surface forces, to prevent enemy interference with the landings.

Before the Luzon landing, for example, a fast carrier task force moved into the South China Sea, struck at airfields on Luzon and Formosa, then at fields around Hong Kong and the Jap bases to the south, in French Indo-China. During the landings at Lingayen Gulf, the carrier force cruised to the west of Luzon, between the amphibious forces and the nearest known Japanese surface forces which could interfere.

Before the landing on Iwo Jima, the fast carrier force steamed up to a point near Tokyo, sent wave after wave of aircraft in to smash at the airfields in the Tokyo area, and then raced back to stand guard near Iwo during the landings. It also supplied additional air support for our assault forces and assigned some heavy ships to aid in the shore bombardment. But the main point is that the fast carriers were placed between Iwo Jima and the nearest strong positions from which the enemy might bring reinforcements.

Missions of the Carrier Task Force

As it developed in World War II, the first war in which carriers were employed, the carrier task force came to have several well-defined missions. One obvious mission was to seek out and destroy the enemy's naval air, a mission effectively begun at the Battle of Midway and definitely concluded in the Battle of Leyte Gulf in October 1944. Another mission was to make pre-invasion sweeps against enemy airborne aircraft and strikes against enemy airfields in order to neutralize enemy air power in the general area of a projected amphibious landing. A third mission was to provide close air support (and perhaps aid in shore bombardment) during an amphibious landing; and a fourth, to make diversionary strikes against remote enemy positions, feinting to draw enemy strength away from the true objective of our operations. Like cavalry in land warfare a century earlier, the highly mobile force of fast carriers was used to focus the enemy's attention and his strength at points advantageous to our plans. Still another mission, primarily involving the gun-firing ships, was to provide general cover for the amphibious force against enemy surface units.

In a broader sense, the mission of the fast carrier task force was much like that of any major fleet in naval history: To establish and maintain command of the broad seas, and thus to insure sea communications required for ultimate victory. Although using aircraft as its primary offensive weapons, the carrier task force is a balanced naval force, equipped to assert command of the seas against any challenge. Its extensive and successful use in the prosecution of specific offensive thrusts with amphibious forces should never obscure its larger function — to insure command of sea communications.

SOME ACHIEVEMENTS OF THE CARRIER TASK FORCE

Guadalcanal

The true usefulness of the carrier forces is best shown by the gradual change which came about in the Pacific war as the fast carrier task force evolved. When our Marines went ashore on Guadalcanal in August of 1942, making an invasion on a shoe-string because the need was desperate, they had to overpower the Japanese garrison. That was not easy. But it was easy compared with the other job — to deal with successive waves of Japanese reinforcements. The Japs then had superior sea power in that part of the Pacific. They were able to reinforce and supply their garrison and make telling attacks with surface forces on our beachhead.

Leyte Gulf

Even two years later, at Leyte Gulf, the divisions that landed in October of 1944 had to defeat first a strong Jap garrison and then defeat a larger force staged in from the west. We still were unable to command all the sea approaches to the island we had marked for conquest.

After that, the story was different. For the victory of Leyte Gulf totally changed the relationship of naval forces, Japanese and American. When General MacArthur's forces landed on the beaches of Lingayen Gulf in December to seize Luzon, they had to fight *only* the garrison of that island. There were no reinforcements that time, no stealthy shuttling in of supplies for the enemy forces, because we fully controlled the adjacent seas.

Iwo Jima

At Iwo Jima, it was much the same. The striking arm of the fleet — the fast carrier task force — isolated the tiny island, and neutralized enemy air bases as far away as Tokyo. This made it possible for the Marines to land with their task limited. Formidable as it was, their job was simply to kill the Japs on Iwo — the Japs who were there on D-day. There was no Tokyo Express to come down the slot by night, even though this was the first American operation against Japan's "inner defense ring," and even though the Tokyo Express would have had only 600 miles to come from Tokyo itself.

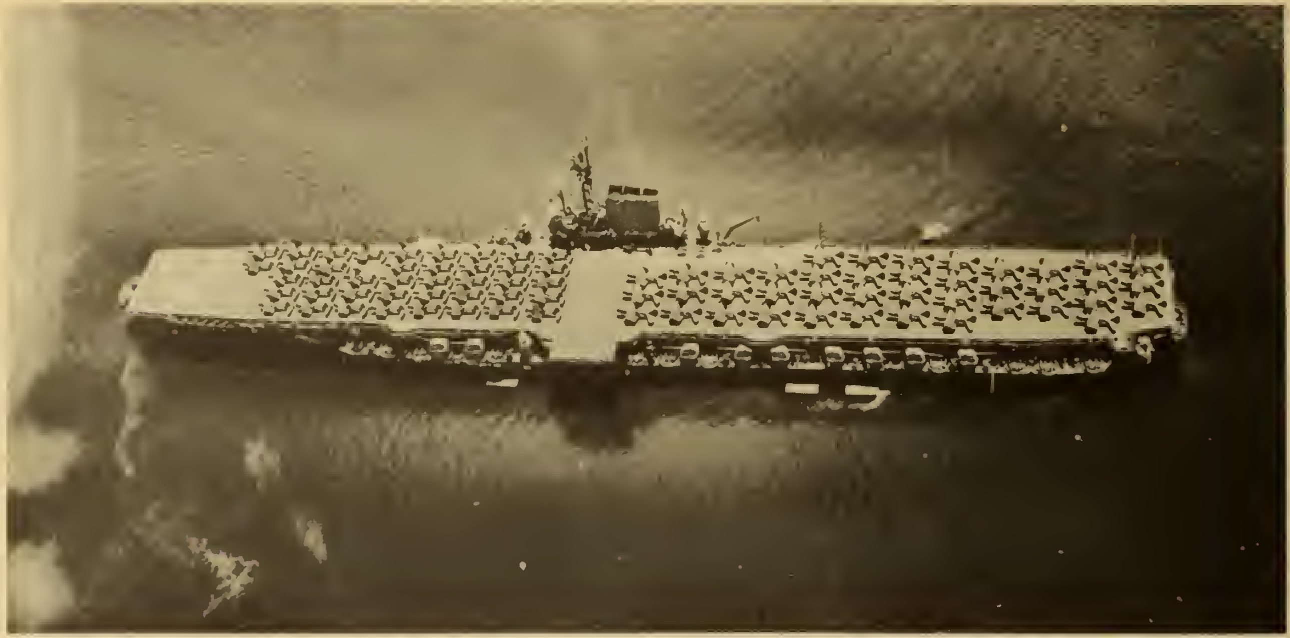
CARRIER SICKBAY
Hospital corpsmen attend the needs of sick and wounded aboard USS *Charger* (CVE30).

ROCKET ATTACK ON OKINAWA
An F4U launches its rockets at a Jap target.

New Function

Besides the orthodox role of providing strategic cover for amphibious landings, however, the carrier force developed a new responsibility during World War II — really a new function of sea power, not seriously attempted until the middle of that war. This was the destruction of enemy land-based air power, the neutralizing of enemy airfields, in a large area around the point of landing operations. This was an air-age type of general cover, an extension of the covering action of a surface fleet to include hostile air power. In other words, the carrier task force had added a new *dimension* to the strategic use of a fleet.

The importance of this new function is indicated by the numbers of Japanese planes destroyed. During 1944, in the Pacific Ocean Areas (not including the Southwest Pacific) 6,650 enemy aircraft were destroyed. Of these, about 5,450 were destroyed by our carrier-borne aircraft. In one busy month of 1945, planes from our fast carriers destroyed more than 1,600 enemy aircraft in the home islands of Japan and the Ryukyu chain alone (18 March to 17 April). In just two lively days off Tokyo, the carrier force destroyed more than 500 Jap aircraft. Obviously, this is more than simply asserting command of the seas.



USS *FRANKLIN D. ROOSEVELT* (CVB42)
Aerial view of the great carrier in the harbor at Rio de Janeiro.

It represents an air-sea offensive to establish command of the air over the enemy's own territory.

Aircraft Types Vary

As it grew in size and battle experience, the fast carrier task force developed to meet each challenge. When it struck against the outer screen of Jap positions in the Gilberts and Marshalls, the dive bomber played a major role, for there were enemy surface forces to engage. In later operations against Jap fleet elements, dive bombers and torpedo planes shared the honors. But when the scene of conflict moved westward to the Philippines, Formosa, and the Empire, the main problem was to deal with the enemy's land-based air. And so the Hellcat and the Corsair, the Navy's main dependable fighter planes, became the premier offensive weapon.

In a similar way, a gap appeared in our armor when the Japanese began to make effective night attacks with their aircraft. The answer was found, within the general framework of the fast carrier task force, in the night fighter—the Hellcat with special radar gear for night interceptions. Primarily defensive in function, the night fighters, a few of which operated from each of the large carriers, made it possible to wage war around the clock in our fleet.

Characteristics Necessary for Fast Carrier Task Force

In summarizing, it may be stated that in order to accomplish its missions satisfactorily the fast carrier task force must — and does — possess the following characteristics:

1. It must provide suitable and adequate bases for the operation of aircraft.
2. It must possess satisfactory mobility characteristics; ability to move far and fast.
3. It must have mobility with endurance—seakeeping endurance, to stay at work for long periods, many months if necessary.
4. It must be capable of a variety of offensive missions, defensive missions, and support missions.
5. In order to accomplish any of the preceding missions, it must satisfy the indispensable requirement of any force; namely, it must be able to command the air for the time and in the area vital to the task.

Changes still continue, for sea war is not a static affair. The rocket has been added to the armory of carrier-based aircraft, adding the destructive power of heavy shells to the speed and range of aircraft.

USS *SAMPAN* FIRES AN L-GUN SALUTE
The *Sampan* (CVL48) is one of the carriers assigned to cruise Reservists. Here, during a cruise to South America, members of the ship's company man the rail while gunners fire a 21-gun national salute to Venezuela.

Carrier Was Weapon of Decision

The aircraft carrier may be said to have been the weapon of decision in the Pacific war. This does not mean it could have achieved victory alone. It merely means that the carrier was the particular weapon which set the pattern for the Pacific war and gave the United States its decisive superiority. And the reason lies in a very old principle of warfare — the principle of *concentration of force.* The fast carrier task force was really a mobile air base, with sometimes as many as 1,500 aircraft available. This force could be placed anywhere in the Pacific, could be moved at high speed, could dodge or zigzag, or could hide under cover. It could stand up to enemy forces of any character. And by this means, the United States could concentrate enormous fighter or bomber air power at any chosen point, at any time. It always could put more air power into a limited area than the enemy, whose airfields were spread over an immense area of islands and mainland. Concentration remains a key factor in warfare at sea, on land, and in the air. The carrier force made possible an astounding concentration of tactical air power.

Because of that, our forces were able to advance across the Pacific in giant strides. If we had had to make each landing within the radius of land-based pursuit aircraft, we could have moved westward only step by step. By-passing whole islands and island groups could not have been risked. But we had a mobile umbrella of air power that was carrier based. And this enabled us to move 1,000 miles from Hawaii to the Gilberts and Marshalls, then 1,000 miles to the Marianas, and then still another 1,000 miles to the Okinawa chain. That probably shortened the war by years and certainly saved a multitude of lives. And that is why the carrier is designated, with no lack of appreciation of other arms and weapons, the weapon of decision in the Pacific war.

World War II was the first major war ever fought across the Pacific. The carrier was at hand and performed impressively. Some future war may not give the carrier the same scope. That remains to be seen. But whenever great oceanic distances are involved, the carrier is a manifestly necessary weapon of sea power.

The most significant peculiarity of a carrier-based air force, the importance of which cannot be overemphasized, is the fact that great extra range for the planes is built into the carrier. The planes arrive at the combat zone with tanks full and pilots fresh. They can thus be moved anywhere in reach of the seas. There is no need to capture a beachhead before the planes can fly. Likewise, the mobility of the force permits selection of the best time and place from which to make the assault, both factors of major importance in using the element of surprise.

CURRENT AND FUTURE ASPECTS

Current Developments

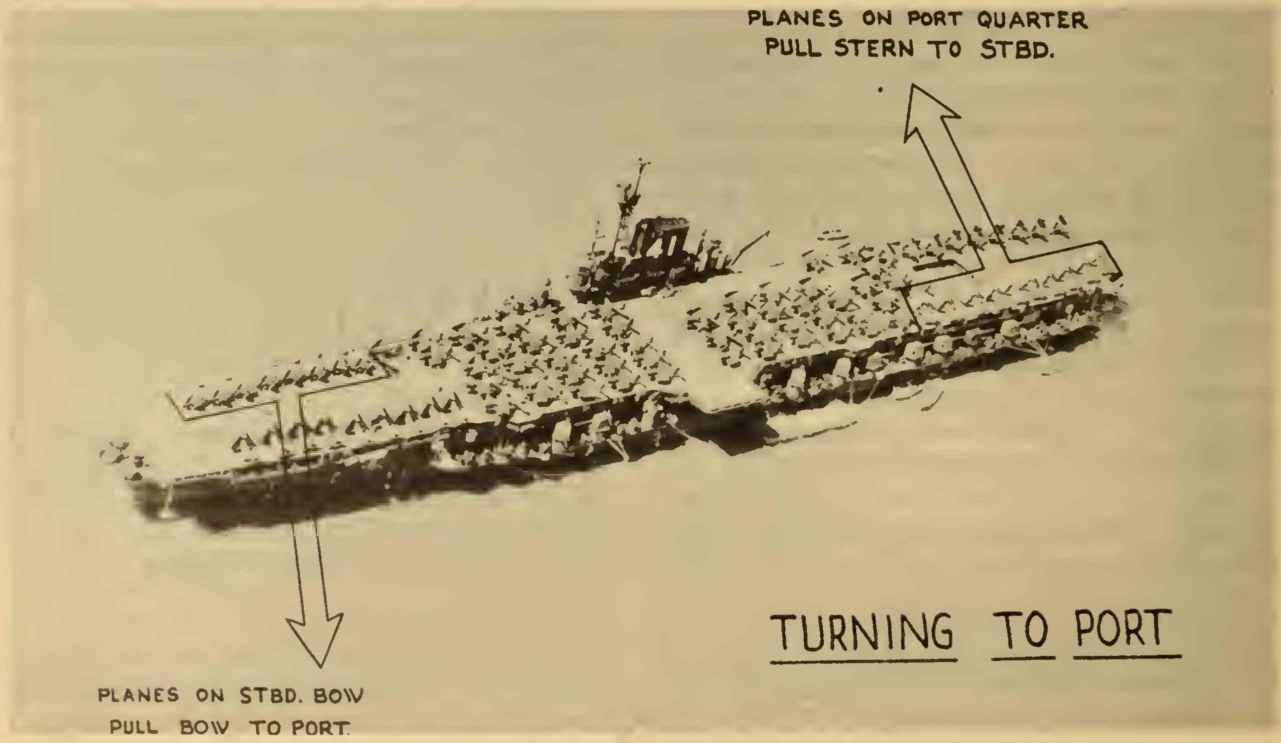
Since the close of hostilities in World War II, jet fighters have been assigned to carriers and have operated successfully, indicating a pattern for the future. The V-2 rocket-powered missile also has been launched from a carrier, experimentally, indicating a possible trend in carrier warfare.

In 1948, the carrier *Midway*, according to press releases, was returned from the Mediterranean for certain structural modifications which had already been incorporated in the other two ships of this class, our largest carriers. It was stated that one of these changes was the strengthening of the flight deck in order to handle much heavier planes. Also there are important developments in catapults which will permit very appreciable increase in the launching load and speed. JATO (jet-assisted take-off) finds more and more application. All these tend toward the same end: the operation of much larger planes capable of greater range.

Possible Future Developments

Just how large a part carrier forces will play in any future war will depend on many factors: on the oceanic spaces involved, on the ranges then attained by long-range strategic bomber aircraft, on the extent of amphibious operations required, and on the stage of development of guided missiles of long range.

Jet aircraft appear to make the carrier more essential than ever. They consume vast quantities of fuel, and must have limited ranges. Consequently they must operate from bases near the combat area. The carrier therefore has an increased value. Robot aircraft may become important. Their use from carriers has been proved practicable, and more practical than very long flights handled by remote control. The carrier of the future may become doubly important as a launching platform for guided missiles.



OPERATION PINWHEEL
This is the Navy's new method of turning a huge carrier in harbor space that does not permit ships to get enough headway to turn on their own engine power. The turning is done by planes secured to the flight deck. They exert a forward pull in the direction in which they are facing, when their engines are turned up.

Part II—Development and Operational Employment of Escort Carriers

History of the Development of the Escort Carrier prior to World War II

The escort carrier of World War II was born of necessity and fully measured up to standards of performance which its proponents had been urging with discouraging results for many years. The first effort of the United States to develop a carrier was the conversion of the collier *Jupiter* in 1919-22 into the *Langley*. The practicability of operating aircraft from a carrier deck was irrefutably proven, but many skeptics remained who questioned their practical value and believed the presence of such ships in the fleet would prove to be such a hindrance to the mobility and flexibility of fleet operations as to nullify their value. Subsequent to World War I, the United States was seriously restricted in efforts to develop a balanced fleet by limitations imposed by the Washington Treaties of 1922. The Navy General Board studied the problem with special attention to the fact that vessels under 10,000 tons were not subject to the restrictive terms of the treaties. Their conclusions which were approved by the Secretary of the Navy included the statement that the Navy could "not afford to sacrifice a cruiser for an aircraft carrier of 10,000 tons or less, even if a satisfactory carrier of that tonnage could be built." Later the Board concluded that a satisfactory carrier would necessarily displace at least 14,000 tons, and it was on this premise that the *Ranger* was built.

While the Navy Department gave consideration from time to time to building a larger number of smaller carriers the general conviction seemed to be in favor of the large carrier carrying the maximum number of planes. This viewpoint received support in a General Board memorandum of June 1939 expressing the opinion that, not only would a 10,000 ton carrier of the "flight deck cruiser" type be incapable of operating more than 36 planes but, if it possessed military features including thorough compartmentation, it could not operate effectively in "even a moderate swell such as is habitually encountered in the Pacific." Attention had been directed to the possible conversion of 10 passenger ships into 20-21 knot carriers but this was dropped when the Secretary of the Navy stated that the changing characteristics of aircraft imposed such exacting demands on carriers that such conversions would not be satisfactory. It must be realized that the Navy had been receiving very limited appropriations for many years between the World Wars and could ill afford to experiment on new construction especially when opinion within the Service was so divided. On the other hand, World War II had been in progress for over a year. Commander Aircraft, Battle Force, invited attention to the urgency of providing small carriers to assume the duties of transporting aircraft to forces afloat and ashore at advanced bases, in the event of hostilities, and to provide carriers for training purposes in order that the large CV's could be utilized for offensive war employment. This viewpoint was concurred in by the Commander in Chief who further emphasized the urgency for such a program.

Meanwhile, the President initiated forceful action by directing the Navy Department to proceed with conversion of ships for the primary purpose of escorting convoys. The submarine menace in the Atlantic was causing deepest concern. Urgency was the keynote of his directive and he indicated first class military characteristics would necessarily be given second consideration to speed conversion. Thus we find urgent need for the CVE type of ship in both the Atlantic and the Pacific, but for somewhat different reasons.

As a direct consequence of the President's directive, the Navy Department received his approval for (1) the conversion or construction of carriers for escort duty, (2) conversion of passenger liners for the purpose of carrying assembled planes to destinations overseas, and (3) the acquisition of seatrain vessels for the transport of aircraft to advanced bases. The urgent need for passenger liners as troop transports resulted in the cancellation of item (2) but the conversion of the transports *Hammondsport* and *Kitty Hawk* fulfilled the plan for the third item.

To initiate plans for the first item, the Maritime Commission transferred the C3 cargo ship, the *Mormacmail*, to the Navy in March of 1941 and, just within the time limit prescribed by the President, a period of three months, the conversion of the USS *Long Island* was completed. Thus we find that in June 1941, just six months before we became engaged in hostilities, we had initiated a modest program to fulfill a need which became increasingly insistent.

Shortly after the completion of the *Long Island*, a similar C3 hull was converted for the British and christened the HMS *Archer*. To meet the increasing tempo of the submarine warfare in the eastern Atlantic the conversion of five additional ships was undertaken for the British Navy. The first one of the five to be completed, however, the HMS *Charger*, was retained by our Navy and remained the USS *Charger*. The necessity for an "island" structure for the adequate control of ship and aircraft operations became evident and the tiny "island" of the *Charger* which was first installed on her became a standard part of all the hundred-odd light carriers built during the war. In December of 1941 immediately after we were drawn into the war, the Secretary approved a 1942 program calling for the conversion of 24 additional hulls. Thus the program of converting merchant vessel hulls to aircraft carriers was fully launched practically simultaneously with the entry of this country into war.

Evolution of the Escort Carrier Type Subsequent to Our Entry in War

Although the 1942 building program included the conversion of 24 hulls, only 20 of the C3 hull type could be made available. These were constructed in the Seattle-Tacoma Shipyards and became known as the *Bogue* class. Ten of the twenty were delivered to the British while the other ten were retained by the United States. Noteworthy in the improvements incorporated in this design were a change to steam turbine propulsion, a larger flight deck (436 by 79 feet) and larger hangar deck space. In order to provide the deficiency of four in numbers, it was decided to convert four *Cimarron*-class fast fleet oilers, known as the *Sangamon*, *Suwannee*, *Chenango* and *Santee*. These ships proved to be eminently satisfactory and would have established the plan for future conversions had there not been such urgent need for oilers particularly in projecting operations far westward in the Pacific. This last group of four vessels had a flight deck of 503 feet by 85 feet. Their greater draft and tonnage provided a more stable platform for air operations. Their characteristics as a tanker gave them "staying qualities" for protracted operations and ability to fuel other vessels of the task group at sea.

USS *CHARGER* WAS ONE OF THE FIRST CVE'S
Experience with the *Charger* led to many improvements on later CVE's.

The *Sangamon* class made its first appearance in the fall of 1942 in the North African invasion, despite the fact that the rush to complete the four ships resulted in their going to sea with yard workmen still on board and scaffolding still in place. They were so successful that a new design, incorporating the lessons learned became the basis for the CVE105 class, the *Commencement Bay* class, which is the standard post-war CVE. The need of oiler hulls to carry oil and the ever-increasing need for CVE's made it imperative to shift to some other type which could be more readily produced.

At this point President Roosevelt again took the initiative. At a conference at the White House in June 1942, it was decided to authorize Mr. Henry Kaiser to proceed with the mass production of the CVE55 class, the *Casablanca* class, and to accept what might otherwise have been considered an unsatisfactory design to the end that speed of mass construction would make vessels available quickly to meet the urgent need for carriers for training, escort, and transport duty. The fact that they subsequently were used offensively with great effect is not only a tribute to the ships but to the quality of the men who manned them.

Wartime Operation of Escort Carriers

During the years before World War II there was an increasing awareness of the need for more and more small carriers as it became apparent that the variety of missions for which they could prove to be useful, if not essential, could not be fulfilled by a limited number of large carriers. The division of opinion centered about details such as tonnage, size of flight decks, armored protection, and speed rather than about the desirability of having more carriers. The search for the ideal delayed the arrival of the escort-type carrier to such a late date that many compromises had to be accepted to meet the imperative requirements of actual conflict. The wartime performance, however, exceeded, in variety of missions, the expectations of their most ardent supporters. Each changing phase of the war seemed to introduce new requirements for their employment, and, despite design limitations they measured up to each new challenge, unpredicted though many were at the time of ship design. Their wartime operations are reviewed in the sections following.

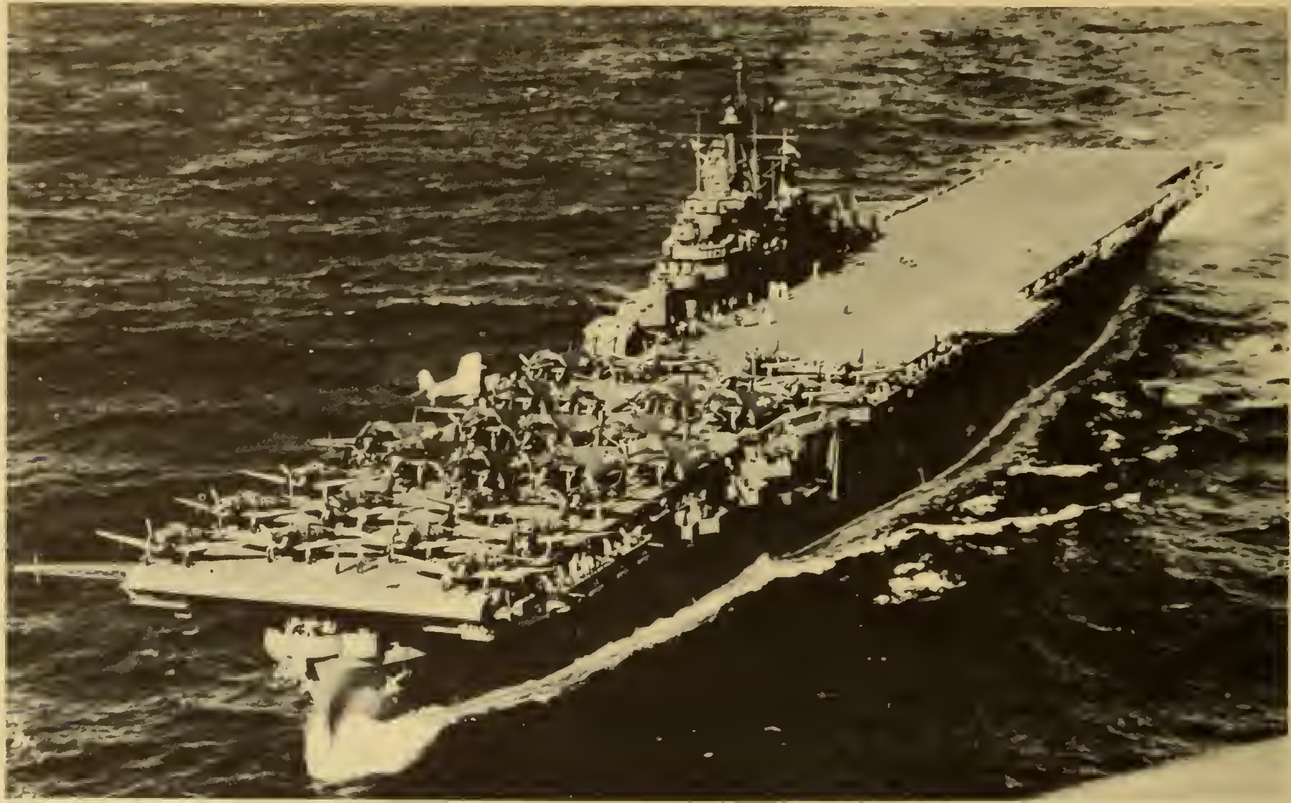
Antisubmarine Warfare

It will be recalled that the original impetus given to the CVE construction program stemmed from the alarming losses being sustained by convoys to Europe. England had succeeded in driving the U-boats out into the open sea because of losses inflicted by the British land-based air offensives. However, there were vast areas of ocean in which the convoys had no land-based air protection. Clearly aircraft at sea were needed and an escort-type carrier was the answer to the need. The *Bogue* was the first of our CVE's to undertake air escort duty. Her first cruise was not too successful because she was confined within the formation of a slow-moving convoy. Weather and sea conditions encountered in the north Atlantic made her problem even more difficult. The changing trend of submarine warfare brought about changes in our methods of attack. As the German submarines were driven farther to sea, it became increasingly difficult for them, lacking support of the German air force, to locate the convoys so the Germans operated in groups to form a scouting line and, if successful in sighting the convoy, would regroup for a concentrated attack. To counteract this, our CVE's would operate ahead of the convoys in position to support either of several convoys, with the added hope that they could, with combined air and surface attack, dispose of the submarines before they had detected the approach of the convoys. By this advanced air and sea search well ahead of the convoys, our task units could and did disrupt the German plans and were in position to warn of any danger and permit the convoys to take evasive action. The flexibility introduced by such tactics coupled with advances in radio direction finders, radar, weapons, and techniques of night flying on offensive missions, turned the tide of submarine warfare and, with the advent of more hunter-killer CVE groups, the capacity to overcome the submarine threat was continuously increased. At one point, the Germans established a doctrine to have the submarine remain surfaced and attack the aircraft with anti-aircraft guns but, except for minor early individual successes, the plan proved to be too costly for them and was discontinued.

The saga of the antisubmarine warfare in the Atlantic is too full of individual ship and individual personal exploits to begin recalling them. It is worthy of mention, however, that the capture of a German submarine by one of the CVE hunter-killer groups gives colorful evidence as to the aggressive manner in which these units achieved their successes.

Admiral Doenitz expressed great confidence at the end of the war that his new-type submarines, equipped with improved radar, snorkel and improved power plants which would permit them to remain submerged for long periods of time at high submerged speeds, would have proved a decisive weapon of offense. Fortunately for us, their late development on the eve of conclusion of the war with Germany prevented their effective employment. His contention does not appear extravagant.

While the principal effort in the antisubmarine phase of CVE operation was carried on in the Atlantic,



USS *INTREPID*—AN APTLY NAMED CARRIER
Four times damaged in battle the *Intrepid* returned each time to strike decisive blows against the Jap fleet.

it is deserving of mention that similar operations were being carried on in the Pacific although reduced in intensity because of the less intensive and offensive nature of submarine operations.

Training

It was apparent before the United States entered the war that the limited numbers of CV's would necessitate the employment of training carriers to permit maximum effective use of the combatant carrier. Early experience in the war, upon the loss of carriers in combat, proved indisputably the imperative need for such ships. The *Long Island* and the *Charger* had proved the practicability of using the CVE-type ship for training. The ever-increasing use of CVE's for this purpose demonstrated again their capacity to fulfill every need as it arose, although this particular one had been well recognized from the inception of plans for such ships. Two unusual conversions of sidewheeler Great Lakes steamers contributed amazingly

HELLCAT TAKES OFF
A Hellcat fighter gets the take-off flag from the landing signal officer aboard one of the carriers of a fast carrier task force. Other ships of the task force are visible in the background.

to this program. As time and availability of ships developed, such training proceeded in most naval continental port areas such as Narragansett Bay, Chesapeake Bay, Florida Coast, Lake Michigan, San Diego, San Francisco, and Seattle. The increased tempo of the war and its translation to more remote areas made it advisable to establish a Carrier Training Squadron Command, Pacific. The extent of training and the degree of pilot efficiency was stepped up before they were sent to forward areas. This was possible because of the availability of more pilots as the training program developed and was necessary because entire groups would be taken forward to the area of combat operations as replacements for those requiring respite from combat. Time did not permit further training once they had reached their parent carrier since its active offensive use was a concomitant of its advanced location. It is a tribute to the effectiveness of this training program that the performance of the replacement air groups elicited uniformly favorable comments from the operational commanders in the combat zone.

Logistic Support and Transport

It requires little imagination to realize that the support of a major war effort in a global war necessitates a tremendous supply and transportation effort. To those who witnessed the magnitude of the effort first hand, it was an achievement which transcended all previous conceptions. Early examples of the use of carriers in this field were furnished by the diversion of the CV's *Wasp* and *Ranger* to provide relief aircraft to Malta and to Africa. The CVE *Chenango* ferried Army P-40's to Africa for the Morocco campaign. The *Long Island* carried the first load of replacement aircraft into Guadalcanal, ready to fly and to fight. Thus the pattern was set for the even greater support role required in the Pacific where the distances were greater and the variety of support and the locations of delivery involved far-flung islands and mobile forces at sea. This had been foreseen as early as 1940 by Force Commanders in the Pacific but the requirements and accomplishments far exceeded the predictions. Our CVE's circled the globe to make a practically endless stream of deliveries.

The aviation logistic problem reached such proportions and the necessity for a well-controlled flow of aircraft to and from the Operating Forces became a matter of such immediate necessity that it was decided to establish a Pacific Carrier Transport Squadron Command to unify control and scheduling. When it was established, there were thirteen ships assigned and the numbers grew with the needs and availability of CVE's until at the end of the war there were over thirty attached. A few figures will give impressive evidence of the CVE contribution to this phase of effort: namely, over 30,000 aircraft carried (including about 5,000 Marine and Army garrison planes to advanced bases as soon as captured and ready to operate aircraft), about 140,000 passengers, mostly aircraft personnel. The total cargo moved from the beginning of this command in June 1944 until 15 August 1945 was over 7½ million cubic feet.

EVACUATION OF THE SICK AND WOUNDED
A Navy patrol plane flies wounded men from the Gilberts.

In the final phases of the war, the campaigns involved larger land masses closer to the Japanese homeland. Hence the duration of the campaign was longer and therefore the support required was continuous for greater periods. The CVE met this problem of replacement planes and pilots by operating with vessels of the train and delivering these planes by air to the CV's on days when the operating task groups rendezvoused with supply vessels for the purpose of replenishment at sea. Logistic support of Operating Forces is not a glamorous feature of war but it is the *sine qua non* of effective war effort. It is time consuming, back

CVE'S RETURN FROM THE PHILIPPINES
Escort carriers are seen from the deck of the USS *Sangamon.*

breaking, and no amount of praise is too great to give to those involved in this phase of effort without whose unstinted assistance victory simply could not have been achieved.

Combat Operations

It has been noted previously that the CVE type ship was, of necessity, called upon to fulfill missions which had not been contemplated at the time of design and that they met each challenge with inspiring evidence of ability. It would be extravagant to imply that they proved themselves to be the equal of CV's in their ability to meet the combat offensive of the enemy. Yet they were called upon to do exactly that due to force of circumstances incident to war, and did exhibit a superb performance. When they proved to be effective in each more ambitious assignment, they were tested further and when proved capable, they excited the same amazement as that instilled in a parent who incredulously observes each new evidence of maturity in his child.

The sequence of this growth can be followed by noting their increasing combat usefulness to the fleet with the progress of the war. Necessity dictated the first use when the *Sangamon* class of CVE were the only carriers available in addition to the *Ranger* to cover the North Africa landings. The seemingly impossible was accomplished by completing their conversion barely in time to fulfill this mission. In order to do so, they had to violate all preconceived ideas as to requirements of precommissioning and shakedown cruises, and the ships and attached air groups joined in this operation with no opportunity to train as a team. The crews of the ships and air personnel were to a large extent totally inexperienced. Thus we find CVE's starting to carry out a mission normally expected of CV's with the added handicap of inexperienced personnel. It was practically a case of patriotic enthusiasts saying "Give us the tools and we'll do the job"; and they did just that, as the reports on that operation fully attested.

The situation in the Pacific had been deteriorating in so far as CV availability was concerned so that, as a result of the sinking of our carriers, the only two remaining were the *Enterprise* and *Saratoga*. Therefore, the *Sangamon*, *Suwanee*, and *Chenango* were transferred from the Atlantic to the Pacific, to supplement this deficiency, in January 1943. The question as to the use of the even more vulnerable CVE's was resolved by the demonstrated performance of the *Nassau* off Attu in support of amphibious landings when land-based air support could not be provided because of poor weather. The *Nassau* was able to meet this challenge because of her ability to operate close inshore and choose her position for operations to fit the weather.

The next noteworthy combat operation involving CVE's encompassed the use of five types of carriers—namely, CV's, CVL's and the *Bogue*, *Sangamon* and *Casablanca* types of CVE's. This occasion was the Gilbert Island landings in November of 1943. The loss of the *Liscome Bay* as a result of a submarine torpedo hit did not occlude the fact that complete mastery of the air was established throughout this operation. This resulted in similar use of CVE's in connection with other carriers in the Marshall Island operations in February 1944.

From this point on, the use of CVE's was regarded as fully justified in combat operations. Particular notice had been taken of their capabilities in close support of amphibious operations. The concept of a Commander Support Aircraft was adopted which gave to the Commander Amphibious Force complete control of all aircraft operations regardless of the organization to which the individual aircraft units belonged.

The Marianas Campaign exhibited full justification of the decision to use the CVE's in support operations, when it proved necessary to withdraw the CV's for the purpose of engaging the enemy fleet and leave the support air operations for Saipan in the hands of the CVE's. The record of their effectiveness on this occasion set the pattern for future operations in which reliance for support was placed on combat CVE's, leaving the CV's and CVL's available to destroy enemy air capacity in advance of amphibious landings and protect the operation from enemy fleet operations from any and all directions. The operations at Palau and Morotai followed, but it was the Battle of Leyte Gulf which found the CVE task group confronted with not only a mission of air support but also with the air and surface offensive of the Japanese fleet. It was at this time that the much-heralded kamikaze pilot first made his appearance in three attacks directed at two CVE's while the northern unit of the CVE task group found itself in an unprecedented surface engagement with capital ships of the enemy. Many factors which have been the subject of interesting accounts of this battle explain the Japanese failure to take full advantage of a situation which appeared to be favorable to them but the fact remains that they chose to retreat leaving the remaining ships of the CVE task force to continue their role in support of the operation.

The continued use of CVE's in large numbers for combat operations led to the decision in December 1944 to establish the functional type command known as the Escort Carrier Force Pacific. In January 1945 the CVE's supported the Luzon landings and again displayed a capacity to meet a situation full of dangerous possibilities for such relatively vulnerable ships. Their successes at Iwo Jima and Okinawa continued to attest their worthiness for combat operations even though kamikaze attacks had taken a considerable toll.

Since this review has been an attempt to record the varied accomplishments of the CVE-type ship despite its recognized limitations due to improvised design and conversion, the account may seem to overemphasize the ship performance with unintentional slight to the gallant crews who manned them. When one has been a member of a ship's company in active operation, the ship seems to be alive to a degree varying with the spirit of the men who man her. The achievements of the CVE's during the war are mute testimony to the fighting spirit of their crews, those gallant men who met the challenge and proved worthy.

CHAPTER 18

NAVAL AVIATION

PROGRESS OF NAVAL AVIATION

Earliest Developments

On 8 May in 1911, the United States Navy wrote its first requisition for a wood, canvas, and bamboo airplane capable of flying at least 45 miles an hour. This day, 8 May, is now the official "birthday" of naval aviation. From such humble beginning came the mighty air arm that today is one of the most formidable instruments of modern naval warfare.

Prior to 8 May 1911, the Navy's interest in the airplane had been aroused by the Langley flying machine. The designs for this plane were studied by a joint Army-Navy board in 1898 which concurred that airplanes could be developed for use in warfare. But when the Langley plane failed to take off in 1903, military interest in aviation subsided and even the success shortly afterward of the Wright brothers' flight at Kitty Hawk, North Carolina, failed to revive it.

Progress in aviation continued and was not unnoted by the Navy. Official naval observers were present in 1908 when the Wrights demonstrated their biplane to the Army. But the Navy, even after a second successful demonstration of this craft, was still reluctant to purchase airplanes until more efficient ones were designed.

Captain W. I. Chambers, who had been detailed in September 1910 to take charge of the aviation correspondence for the Office of the Secretary, became dissatisfied with the role of letter writer and began to study the whole problem of scientific construction of aircraft suitable for use with the fleet. He became the leader of a steadily increasing number of air-minded naval officers. Captain Chambers was desirous of finding out whether or not a plane could be launched from the deck of a ship, and his persuading of Eugene Ely, a Curtiss pilot, to make this attempt resulted in the first take-off from a ship, USS *Birmingham.* The Navy Department was now interested enough in aviation to accept the offer of Glenn Curtiss to teach a naval officer to construct and to fly airplanes. The officer selected was Lieutenant T. G. Ellyson who received orders on 22 December 1910 and for the next few years helped Curtiss design planes for the Navy. He learned to fly and while so doing worked out a training plan for future naval aviators. In January 1911, Ellyson assisted in another demonstration of ship-to-shore flight when Ely flew from San Francisco to a platform on the deck of USS *Pennsylvania.* After an hour on deck the airplane was turned around and Ely flew back to his base.

Curtiss had long been interested in a "water machine" and was encouraged by Ellyson and Captain Chambers to design an airplane with a hydroplane attached. This machine successfully demonstrated its ability to fly from a harbor, land on the water alongside a ship, be hoisted aboard, hoisted off again, and flown from the water back to the base. While Ellyson and Curtiss were busy with these problems, the Wright brothers, also desirous of selling airplanes to the Navy, were teaching Lieutenant John Rodgers, USN, to fly a Wright landplane.

Captain Chambers was now in the Bureau of Navigation devoting full time to aviation affairs. As soon as Curtiss had perfected his hydroaeroplane, Chambers asked for and received $25,000, included in the 1911-1912 Naval Appropriation Act, to buy a few airplanes and train more naval aviators. In July 1911, the Navy received its first airplanes—a Wright Model B landplane, a Curtiss slow-flying landplane for training purposes, and a Curtiss hydroaeroplane.

Progress Prior to World War I

A naval aviation camp was established in 1911 near Annapolis where more officers could be taught to fly and where the aviators could make improvements on the planes with the aid of the personnel of the Naval Engineering Experiment Station. Progress continued and some records were established. Lieutenant John H. Towers (later Admiral) kept a hydroaeroplane in the air for something over 6 hours, covering a distance of 389 miles at altitudes ranging from 200 to 1,200 feet; Lieutenant Ellyson reached an altitude of 3,200 feet in a hydroaeroplane in 1912; and Lieutenant Bellinger bettered this record in the following year by reaching an altitude of 6,200 feet in 45 minutes.

In January 1913, naval aviators had their first opportunity to take part in operations with the fleet. They took their eight airplanes to Guantanamo where the fleet was holding its annual winter maneuvers. The aviators demonstrated their ability to use the planes for scouting, detecting submerged submarines and defense mines, and aerial photography. They also took some officers of the fleet on flights to show off their machines and taught a few to fly. After this there was an increased interest in the development of more scientifically designed machines for the Navy, and research was started in earnest.

The General Board recommended in August 1913 that an Air Department be established and that the Director of Naval Aviation organize a Naval Air Service suited to the needs of the Navy in case of war. In October 1913, the Acting Secretary of the Navy, Franklin D. Roosevelt, appointed an aeronautics board to organize the service, with Captain Chambers as senior member.

The board made a number of valuable recommendations, not all of which were carried out due to the fact that the Secretary of the Navy asked for only a third of the amount of money that the board had requested. However, 10 new planes were bought and an aeronautics station was established at Pensacola, Florida, in 1914.

ONE OF OUR FIRST PLANES
The first airplanes of the Navy were ordered in 1911. The speed was about 40 miles an hour.

The aeronautics station was commanded by Lieutenant Commander H. C. Mustin, under the direction of Captain M. L. Bristol who had succeeded Captain Chambers as head of naval aviation. (Captain Chambers remained for a number of years as aviation consultant.) The station consisted of a flying school and experimental laboratories. Lieutenant Towers started the training school, new aircraft were tested, and new designs for naval planes were drawn although actual construction was done by private firms.

Some decisions made by Captain Chambers and other naval officers were instrumental in determining the type of planes with which we entered World War I and the methods of using them with the fleet at that time. First of all, Chambers wanted an amphibian with landing gear that could be housed in the body during flight. While the work at Pensacola was getting underway, circular letters were being sent to a number of manufacturers, advertising a competition for this type of plane.

Chambers also refused to consider bombing planes for the Navy. He had seen demonstrations and tests of such craft and urged the manufacturers to improve the small, lightweight scout planes before attempting to build one strong enough to carry ordnance. He also wanted to restrict the size and weight of naval aircraft in order to permit their use on battleships and cruisers. The French had attempted to use a ship as a carrier, but Chambers was opposed to this idea on the ground that the Navy already had too many auxiliary vessels.

Immediately prior to World War I, the first opportunity to use planes with the fleet under war conditions occurred when two of the Navy's heavier flying boats were sent aboard USS *Mississippi* to Vera Cruz during the latter part of April 1914. These planes made reconnaissance flights over the trenches and roads in and around the city and brought back reports of troop movements. One of the planes came back with a few bullet holes, the first received by an American plane. As a result of their performance at this time, experimental work at Pensacola and at the Model Basin was stepped up with the purpose of correcting the defects noted in the current aircraft.

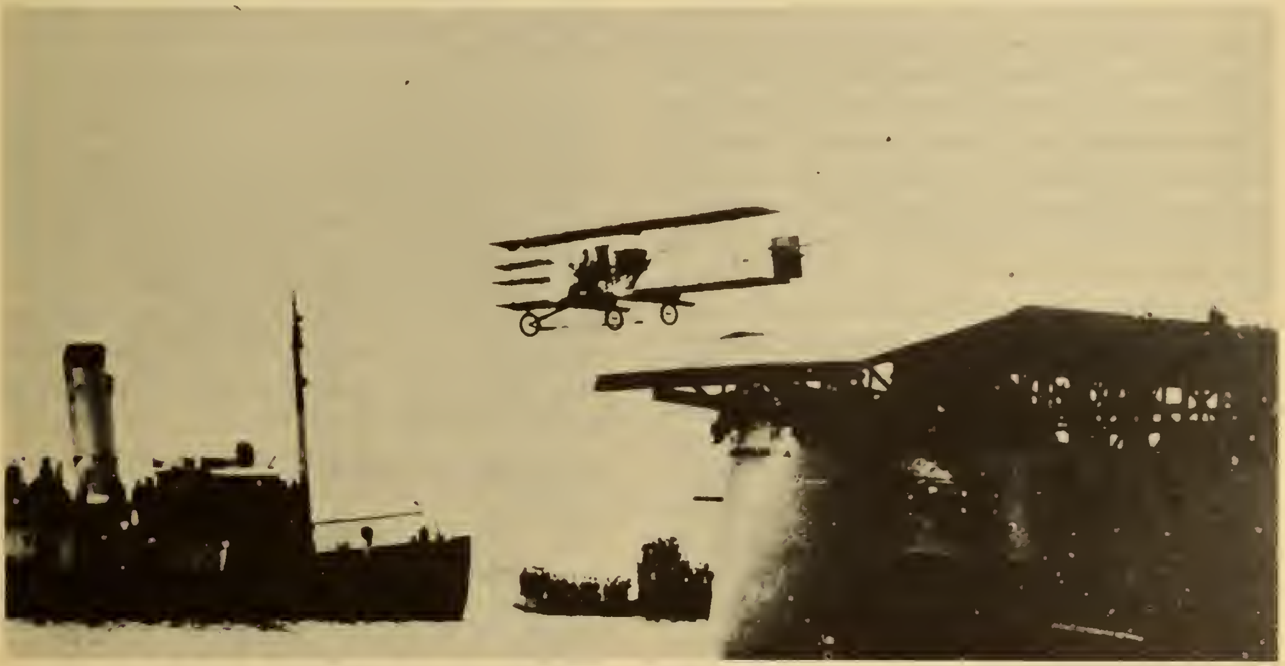
Naval Aviation During World War I

Following the assassination of the Austrian archduke on 28 June 1914, the outbreak of war in Europe gave American naval observers an opportunity to watch aerial action in wartime.

Since most of this action in the early part of the conflict was over land, the observers gained few new ideas that might be used as a basis for modifications in naval aircraft. At home, Pensacola was still unable to secure money for extensive operations or new planes, but the aviators, using what they had, continued to prepare for war.

Establishment of the National Advisory Committee for Aeronautics in April 1915 was a forward step in naval aviation and the work of the committee gave the Pensacola group many new ideas, but there was little money from appropriations to put these ideas to work. In 1916, Pensacola was at its lowest strength with most of the instructors in Europe observing, few new students entering, only a small number of new training planes arriving, and the old ones wearing out. But experiments continued principally in dropping bombs and in using machine guns in planes.

In 1916, the Secretary of the Navy ordered the reorganization of the Pensacola station. The experimental design section was enlarged, facilities for testing airplanes were increased, and arrangements were made for building a few machines at the station. Previous to this time only elementary flight instruction had been given at Pensacola, but in the latter part of this year an advanced flying school was estab-



TAKE-OFF FROM USS *PENNSYLVANIA*
In January 1911, this demonstration of ship-to-shore flight was considered remarkable. A specially constructed platform on the *Pennsylvania* was the "flight deck."

lished and the elementary training was transferred to other schools throughout the country.

By 6 April 1917, the Navy had only 38 pilots and 163 aviation ratings, plus 5 officers and 30 men of the Marine Corps; planes numbered 54, none of them good enough for war service. An appropriation for $3,500,000 had been granted to the Navy for aviation, and more airplanes could be ordered, but the Navy had to take its turn since the manufacturers were busy with Army and Allied orders. As the training planes began to arrive in larger numbers, the next problem was to find students. The Navy took in civilians, placed them in the Naval Reserve, and gave them flight training. A group of students at Yale had already taken up flying in order to be ready for war, and the first Yale unit soon joined the Reserves and was sent to Pensacola for advanced training. Similar units were enrolled from other institutions and, as in World War II, the colleges and universities supplied the Navy with hundreds of young men highly qualified for pilot training. The Navy now had its pilots but lacked service planes.

As a partial remedy for this situation, the Naval Aircraft Factory was opened at the Philadelphia Navy Yard on 6 August 1917 for the construction of airplanes designed by various companies, for experimental work, and for the overhaul of older machines. By 31 December 1918, the factory had delivered 183 twin-engine flying boats and 4 experimental seaplanes, the largest flying boats yet attempted. Naval air stations were established from Nova Scotia to Panama in order to protect our own coast from German submarines.

United States naval aircraft in World War I were used mainly for convoy duty in European waters, to patrol areas where submarines might be, and to bomb enemy naval installations. Without waiting for airplanes, a naval aviation detachment of 6 officers and 64 enlisted men arrived in France in June 1917, and immediately began to establish bases from which they could operate. Until American airplanes could be constructed and shipped to Europe, the aviators had to use various foreign machines. Some of these machines were too light to carry machine guns or bombs, and the pilots flew with pistols, rifles, or shotguns across their knees. Hand grenades or even rocks were thrown when nothing else was available. When the larger flying boats began to arrive from America, machine guns were installed. The size of the flying boats also made it possible to carry heavier bombs. The best combat flying boat to arrive in time to be used in World War I was the Curtiss H-16, produced by the Curtiss Company and the Naval Aircraft Factory. This plane could carry 4 men, a radio, two 230-pound bombs and 4 machine guns while flying at top speed of 95 miles per hour, and it had an endurance of 4 hours.

Although experiments had been initiated with radio communication between airplanes and shore stations or ships and with the use of navigational instruments, very little was accomplished before the war. Most of the earlier radio sets weighed too much to be included in the useful loads of the early planes, and messages could be sent for only short distances. During 1918, four different types of radiotelephone transmitting sets were made but were not entirely dependable. Captain Chambers invented a special compass for airplanes, and in 1918 an improved one was made. During the war about 35 different kinds of instruments were either invented or improved. Progress was also made in the development of new types of planes, but these were not completed in time to use in the war.

By 11 November 1918, the Navy's air force in Europe had increased to 1,147 officers and 18,308 enlisted men. During the 19 months that America was in the conflict, naval pilots made 22,000 flights, patrolled over 800,000 nautical miles, and dropped 100 tons of explosives on enemy installations, suffering only 19 casualties during these operations. Considering the fact that so few naval planes and pilots were available when the conflict started and that aviation was actually in its early stages of development, this is indeed an impressive record.

Progress Between Wars

At the close of World War I, plans were already in progress to extend the activities of naval aircraft to include more than antisubmarine patrol and the bombing of shore establishments.

Fighting planes were being designed for the protection of flying boats which in turn were becoming larger and more self-sufficient. Among other fighter planes developed was the TF, a torpedo fighter to use against enemy seaplanes in the North Sea where the flying boats were having trouble on account of the severe cold and the rough seas. A very large flying boat, the NC type, was developed by the Navy and Curtiss. Four of these craft were finished in 1919 and one of them, the NC-4, completed in May of that year the first transatlantic flight.

The Navy had elaborate plans for the construction of all types of airplanes; but as soon as the Armistice was signed, naval appropriations were trimmed; in addition, many experienced aviators and engineers returned to civilian occupations. But experimental work on all aerodynamic problems necessary for the construction of airplanes was authorized, using the funds available. The General Board recommended the acquisition of scouting, bombing, torpedo, observation, fighting, and patrol planes. Although the Navy had made only one unsuccessful attempt to use planes on ships during combat, the General Board now accepted Chambers' original idea of placing airplanes on fighting vessels. All these recommendations were made after a thorough study of operations in the war.

Progress continued. In 1921, naval aviation attained bureau status with the creation of the Bureau of Aeronautics. Completion of the conversion of the collier *Jupiter* brought into existence the first aircraft carrier, USS *Langley*, commissioned in March 1922. Experiments in the use of catapults and arresting gear continued. Recommendations were also made to the Bureau of Aeronautics for the improvement of carrier aircraft. One of the most important of these improvements was the construction of an all-metal plane.

In 1926, President Coolidge appointed a group known as the Morrow Board to study the employment of aircraft in national defense. This group advised an increase in naval aviation personnel, extra funds for new and more advanced types of aircraft, and the establishment of a new assistant secretaryship to be concerned with aeronautics. Thus the Navy started on a five-year program of expansion, at the end of which it had 1,000 serviceable aircraft on hand.

Experimentation in aircraft functions progressed. Bombing, long cruises, formation flying, and sending of radio messages were some of the activities that were practiced. The growing unrest in Europe led Congress in 1934 to pass the Vinson-Trammell Act. The Navy was thereby authorized to construct, among other things, an additional number of airplanes. The department planned an integrated program of procurement of carriers, tenders, cruisers, battleships, and the aircraft to equip them; this program was to extend over a period of five to seven years. It was during this period that the new and improved models used in World War II were developed.

Much of the experimental work was directed by the Bureau of Aeronautics and carried out by the Naval Aircraft Factory and by private firms under the direction of BuAer. There was also more and more cooperation with other research organizations. Many of the aerodynamic problems were solved by the National Advisory Committee for Aeronautics, and there was a constant exchange of ideas among the Navy and the Army Air Corps, Army Ordnance, the Bureau of Standards, and other governmental and private agencies. New types of airfoils were created to increase the speed of aircraft: high lift devices, flaps, and low-speed controls; and better seaplane hulls were designed to add greater controllability and maneuverability to all types of naval aircraft. Carrier aircraft have always presented a problem in designing because of their restricted size but during this period their speed was increased, folding wings were constructed to facilitate stowage, and the planes were given still greater cruising range. In order to increase the striking power of carrier aircraft, there was developed the scout bomber capable of carrying 500-pound bombs and launching them in diving attacks without restricting their scouting characteristics. Other types of airplanes were designed to carry heavier offensive armament than had previously been possible. For patrolling, flying boats were given increased endurance and the ability to carry heavier loads.

Developments were made in the field of instrument design. Nonbarometric altimeters, better drift and ground speed indicators, direction finders, and blind-flying instruments made it possible for the naval planes to operate in all kinds of weather. Advances were made in the armament carried by aircraft and in the instruments to assure accuracy of firing during flight, such as the Norden bomb-sight.

The provisions of the Vinson-Trammell Act also permitted the Navy to improve their air stations and to establish new ones both for training pilots and for the protection of the United States.

In June 1934, USS *Ranger,* the first ship designed from the keel up as a carrier, was commissioned. As part of the general program of increasing aviation facilities, plans were made for the construction of USS *Yorktown* and *Enterprise* and these carriers were finally commissioned in 1937 and 1938. Production was speeded up to provide aircraft for the new carriers and for the new battleships and cruisers that were to be equipped with planes.

The Aviation Cadet Act, passed in April 1935, was for the purpose of providing the additional aviation personnel needed for the rapidly expanding aviation facilities. These cadets were classified as three-year Reserve officers and were trained at naval stations. Further increases in the number of students from time to time brought the number to 605 by 1938 (as compared to 30 at Pensacola in 1933). A new training station was established at Corpus Christi and later another at Jacksonville, and preliminary instruction under the control of CAA was given in colleges. The Naval Reserve Act of June 1939 provided for a maximum of 6,000 aviation Reserve officers and the establishment of new training bases.

Naval planes continued to make long-distance, mass flights without accidents, and each year previous records for nonstop, nonrefueling, formation flights were broken, showing that the new machines were capable of the consistent long-range performance so necessary for fighting planes. All limitations on ship tonnage and armaments were forgotten by 1938 and naval aviation expanded as rapidly as possible.

After the fall of France in June 1940, it was practically certain that the United States would be drawn into the conflict, and Congress authorized the immediate purchase of 4,500, then 10,000, and finally 15,000 naval aircraft during that year. But as in the first war, production was already falling short of the demands placed upon it by the Army, Navy, and foreign countries. Government funds were soon granted to private firms to increase their facilities for aircraft research and manufacture, and the National Defense Advisory Commission was appointed to coordinate allocation of airplanes.

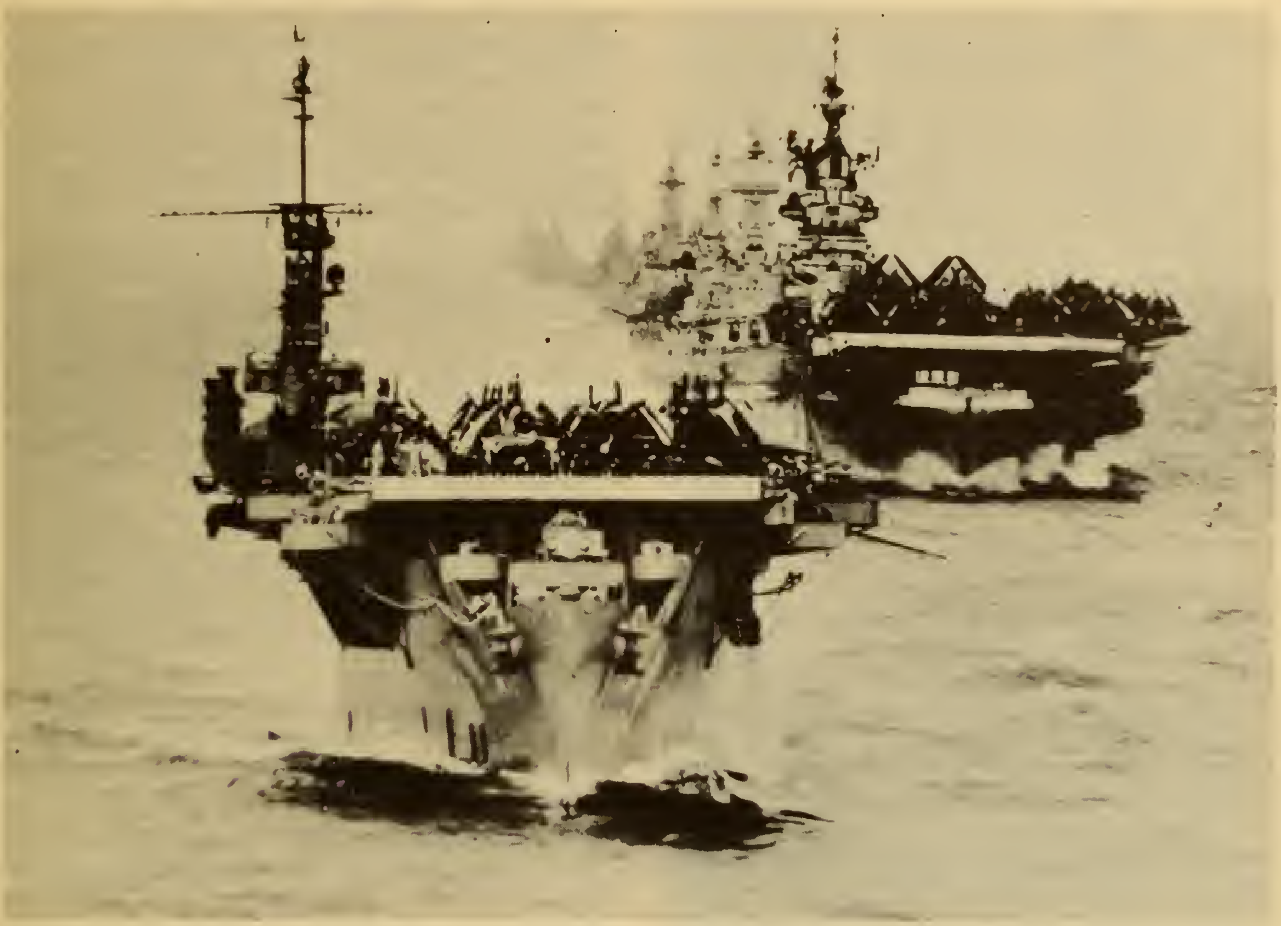
Establishment of additional bases in the United States and in the Pacific proceeded rapidly even though the new planes were not yet available. Bases in Newfoundland, Bermuda, and the West Indies were obtained from Great Britain, making it possible for patrol operations to be extended much farther. Passage of the Lend-lease Act in 1941 brought up the need for naval patrol planes to protect ships for some distance after they left our ports. Bases in Iceland and Greenland and along the northern shore of South America, established to protect supply routes,. also afforded further experience for aircraft operation—all this before the United States had entered the war.

World War II

If any lingering doubt as to the effectiveness of shipboard aviation remained in military minds at this time, it was effectively dispelled after the first blows struck at Pearl Harbor on 7 December 1941. Fortunately American carriers were absent from the scene that fateful morning and hence could deliver some retaliatory blows soon afterward on enemy installations in the Pacific.

The following discussion of naval aviation in World War II does not attempt to recount all of the many achievements of naval planes and carriers. It is, rather, intended to set forth the manner in which naval aviation was employed during the conflict.

The enemy's steady progress toward Australia threatened supply lines to the Southwest Pacific. But in May 1942, as they were ready to round the eastern end of New Guinea and to land on the island's southern shore at Port Moresby, they met their first major setback. The carriers *Lexington* and *Yorktown* intercepted their advance and after a series of engagements stretching from 4 to 8 May, they turned back. Tactically, the Battle of the Coral Sea was perhaps a draw, but strategically it was of the greatest importance. The following month, the small forces at the disposal of CinCPac turned back a superior Jap force at Midway. The battle, on 3 and 4 June, resolved itself into a struggle for control of the air, and this was unquestionably achieved by the United States forces which succeeded in sinking all four of the enemy's carriers. After they lost their air cover, the Jap forces turned back and were pursued for two more



COMBATANT SHIPS

In the foreground is a carrier of the *Independence* class, followed by an *Essex*-class carrier, three battleships, and three cruisers.

days until they passed out of range. On the darker side, USS *Yorktown,* badly battered by air attack, was sunk by an enemy submarine torpedo while being towed to Pearl Harbor, and about 150 American aircraft were shot down in what both sides later agreed was the turning point of the war.

The defensive war in the Pacific was ended, and from here on the United States and its Allies could move forward to a limited counterattack of their own. The push began on 7 August 1942 when the Marines landed at Guadalcanal. The Marine air force, small though it was, accounted for much damage to the Japs in this area from this time to the close of hostilities. Army and Navy sent what aircraft they could, but the Marine air force went out and fought under unbelievably poor conditions.

After Midway, the Japanese, having lost a significant portion of their carriers, land based their crack air groups and saw them gradually abolished by the mounting United States air strength. Many of their skilled airmen were sacrificed in the Solomons campaign. In February 1944, they withdrew what remained of their air groups from the South Pacific Area.

On the other side of the world also aviation was in action. Naval carriers covered the landings in Morocco in 1942 and those in southern France in 1944; battleship and cruiser aircraft spotted naval gunfire in Sicily, at Salerno. A major contribution of naval aviation in the Atlantic was in antisubmarine operations with the purpose not so much of sinking U-boats as to get the ships carrying men and supplies safely to their destination. Here the closely coordinated action of air and surface units brought gratifying results.

Day after day both flying boats and land-based aircraft set out from bases along the coasts of North and South America, from the islands of the Caribbean, from North Africa and Bermuda and the Azores, from Newfoundland, Greenland, and Iceland, and from the shore of Britain itself.

But even the best efforts of land-based planes could not reach far enough and here is where the escort carrier (CVE) came through, starting in March 1943. The aircraft based on the CVE's accounted for a considerable percentage of the German and Italian submarines sunk to keep the supply lines unbroken.

FORMATION FLYING
Twelve Grumman Avenger torpedo bombers lined up in perfect echelon.

By the end of 1942 the Southwest Pacific Command under General MacArthur was working its way back toward the Philippines. Fleet Air Wings 10 and 17 provided assistance in the form of overwater reconnaissance and antishipping attacks. The latter activity was distinguished by Black Cat operations in which the Catalinas, painted in somber hue, surprised Japanese cargo vessels trying to sneak supplies to beleaguered garrisons under the cover of darkness.

In the Pacific Ocean Areas, a portion of Admiral Nimitz' forces were taking part in the Solomons campaign; others were sent to the Aleutians to break the Japanese foothold on Kiska and Attu. United States forces landed on Attu on 11 May 1943 and in the bitter weeks of fighting that followed, the escort carrier *Nassau* supplied a great part of the air support that our troops received. Attacks by land-based aircraft were nullified by the weather but the planes of the *Nassau* operating close in took advantage of even minor breaks in the weather to aid the hard-pressed soldiers ashore.

The presence of the *Nassau* came as the outcome of much lively discussion among members of Nimitz' staff. High-gear production on the home front was sending a steady stream of material to the Pacific. Naval officers who had never enjoyed so many varied "tools" with which to work argued about their best employment. Although the escort carriers had been designed for antisubmarine work and to transport aircraft to distant island bases, some officers believed that they could be used in combat, and the *Nassau* went to the Aleutians to test the validity of their belief.

The effectiveness of the new fast carriers of the *Essex* and *Independence* classes gave further proof of the dependability of the flat-tops in combat. They launched telling blows against Marcus Island, followed shortly by raids on the Gilberts and Wake. Under cover of carrier aircraft, Marines and Army ground troops went ashore on Tarawa, Makin, and Abemama Atolls (in the Gilbert Islands) on 20 November.

Late in January the same forces moved forward to the Marshalls where they landed on Kwajalein and Majuro Atolls. In this operation, Rear Admiral Mitscher made his first appearance as a task force commander under Vice Admiral Spruance of the Fifth

Fleet—a pair whose achievements would rival those of any of the great names of naval history. With Kwajalein secure, the carrier task forces moved on and after raiding the Japanese base on Truk swung northward to visit Saipan, Guam, and Tinian in the Marianas where, in addition to their guns, the planes unleashed their cameras to obtain pictures of interest to the planning staffs back in Hawaii. Shortly afterward, carrier aircraft demonstrated their versatility by laying mines which made the harbor of Palau dangerous to use for weeks afterward.

When the carriers first moved against Marcus in August 1943, the discussion of their most effective employment had by no means ended. It was transferred, however, from the staffs at Pearl Harbor to the fleet at sea. From these early operations, there gradually emerged a pattern which had reached virtual completion by the time the invasion of the Marianas commenced in June 1944. The fast carriers were employed in initial raids on the target to assist in softening up; then moved to isolate the area by attacking enemy air installations within operating range; and finally prevented the enemy from bringing up reinforcements or otherwise coming to the aid of his troops under attack. It was always the hope of the naval commanders that the Japanese fleet would make an appearance during one of these landings so that it could be further reduced.

The escort carrier, on the other hand, accompanied the amphibious force, to which it afforded air protection in transit and to whose troops it afforded close air support once they were ashore. The technique of close air support which permitted air attacks within a hundred yards of the front lines was constantly elaborated and perfected during the war. Land-based Marine squadrons also used these methods with particular success, and in 1945 some Marine air units were based on escort carriers to support landings. In case of emergency fast and escort carriers provided mutual support. The same use was made of Marine and Navy land-based air, when it was within operating distance. Beginning with the Marianas, flying boats based on tenders moved in with the invasion forces and commenced patrol and reconnaissance operations before land fields could be captured and restored to use. Cooperation with Army Air Force units, which had been ragged at the time of the Coral Sea engagement, constantly improved as Air Force and Navy commanders grew to know one another's needs and capabilities.

BATTLE-TRIED *ENTERPRISE*
This photograph of the flight deck of the *Enterprise* was taken from a plane that had just taken off.

In June 1944 in the Marianas, United States carrier aircraft made the most of its opportunity to strike at the Japanese fleet, which, having lost its aircraft and having had two carriers torpedoed by submarines, was heading for home as fast as it could go. It was finally discovered on the afternoon of 20 June and a strike was launched at extreme range. As the American planes bored in, the Japanese threw up a heavy volume of antiaircraft fire. But the enemy's air protection was light and in the ensuing attacks their losses were severe. The Battle of the Philippine Sea saw the virtual nullification of the Japanese carrier air force as an effective fighting unit. The air groups so laboriously assembled and trained after the disasters of Midway and the Solomons had been cut to pieces. They were never replaced—the tempo of war was too rapid.

Admiral Mitscher awaited the return of the planes he had sent after the enemy fleet. As darkness fell, he violated some rules that he himself had made. On his order, the ships turned on their lights, making themselves perfect targets for any enemy aircraft and submarines that still lurked in the vicinity but also making them visible to returning pilots whose planes were damaged and whose gas supply was about expended. Naval aviation was saving its most precious asset—the highly trained men who flew its planes.

On Saipan, Guam, and Tinian, until organized resistance on these islands ceased, the escort carriers continued their close air support, and the fast carriers had made numerous forays into the area attacking islands both to south and north to prevent the enemy from sending in air raids against our ground forces.

In the Battle of Leyte Gulf in October 1944, naval aviation played an effective part in harassing the approaching enemy, disposing of a carrier force coming down from the Empire, and pursuing the retreating enemy. A small unit of escort carriers off the island of Samar was surprised by the main Japanese force. At close range and against seemingly impossible odds these ships and their destroyer screen fought back not only with aircraft but also with gunfire and torpedoes.

Two aspects of the air activity in the Leyte engagement are significant. Although the enemy delivered many savage air attacks, he depended on land-based aircraft whose sorties were poorly coordinated with the actions of his surface forces. The United States on the other hand depended entirely on carrier-based planes whose flexibility in meeting unforeseen contingencies and cooperation with surface forces were amply demonstrated. Before the war, many students of aviation questioned whether carriers could operate in the vicinity of large land masses amply stocked with land-based air. At the Battle for Leyte Gulf they received their answer, an answer that was reiterated in the following months not only in the Philippines but also off Okinawa and within sight of Japan itself.

Carriers covered the landings on Mindoro in December and those in the Lingayen Gulf section of Luzon during January. After the Lingayen landings, carrier support of the amphibious landings was no longer required in the Philippines. Marine air units, however, were attached to the Sixth Army and indoctrinated ground force officers into the meaning of close support as the Navy and the Marine Corps understood it. Originating in the methods first employed to achieve accuracy in bombing ships and further developed in the coral atolls of the Central Pacific where support had to be close if it were going to hit the island at all, this technique came as a revelation to many ground troops whose response took the form of enthusiastic appreciation which was most gratifying to their Marine comrades in arms.

Throughout the remainder of the war, naval aviation continued to be notably effective. Around Iwo Jima escort carriers were clustered, giving what support they could to the Marines ashore. But Iwo was a matter for flame throwers and hand grenades and assistance from aircraft.

Initial air support on Okinawa was provided both by fast and escort carriers, some with Marine air units, followed by Marine and Navy land-based squadrons and by Army Air Force squadrons, arriving as soon as captured airfields had been put in operating condition. Tender-based naval flying boats furnished search and reconnaissance before the troops went ashore on the main objective. When adequate facilities were ready, naval land-based patrol planes relieved the flying boats and conducted search and anti-shipping sorties as far north as the shores of Korea.

Before the war, it was frequently alleged that carriers could not carry on sustained operations. At Okinawa, fast carriers remained at sea for over 70 days, and escort carriers over 80 days. New aircraft were brought up by special escort carriers assigned to the job; new air groups and squadrons were flown aboard to relieve personnel wearied by the tempo of operations. The floating air bases could be supplied as easily as the land bases used by the Marine Corps and the Army and were much more flexible in their ability to move around. That was one of the triumphs of the Navy's logistical system.

Okinawa was the climax of the Pacific war. But at the time it occurred it was overshadowed by the prospective invasion of Japan. In July, Admiral Halsey and Vice Admiral McCain (who had relieved Admiral Spruance and Vice Admiral Mitscher on 22 May before the end of the Okinawa campaign) led the Third Fleet against the main islands of Japan. They were joined by a British carrier task force whose ships took the place of those carriers and other ships still under repair as a result of the damage inflicted by the kamikazes in April and May. These combined forces were still standing off the coast of Japan when the enemy surrendered.

POST-WAR DEVELOPMENTS

Continued Progress in Naval Aviation

Since 1945, the Bureau of Aeronautics has increased its research and development program. Utilizing all the great advances in modern science, airplanes capable of even greater performance than was achieved in World War II are being developed. The fantastically high speeds and the greater maneuverability now demanded require still further research in aerodynamic theories. Airplanes capable of withstanding the high loadings imposed by increased speed, particularly supersonic speed, must have stronger structures and new configurations. Airfoils must be redesigned, and more powerful engines constructed. The Navy's flying boats must be capable of still greater endurance for patrolling larger areas.

On 1 October 1946, a world record for nonstop flight was set by the "Truculent Turtle" (P2V Neptune), a two-engine landplane designed by the Navy and Lockheed as a long-range search and reconnaissance plane with a nonstop cruising radius of 5,000 miles and a top speed of 300 mph.

"Operation High Jump," the peacetime expedition of Task Force 68 to the Antarctic, gave the Navy much scientific information that was used in developing the machines and equipment required for cold-weather operations. Ski-rigged R4D's which had been transported by and flown from the deck of a carrier, and patrol seaplanes (Mariners) explored and photographed from the air several hundred thousand square miles of territory never before seen by man.

The post-war years have also seen the rapid development of helicopters, jet-propelled aircraft, and various types of guided missiles. Four S-51 Sikorsky's and some smaller HO3S's were operated off carriers during "High Jump," off the *Saidor* at Bikini, and finally from the *Franklin D. Roosevelt* during maneuvers with the Atlantic Fleet in June 1947. The helicopter proved during those tests that it could be used for a number of purposes: air-sea rescue, carrying mail and passengers between ships at sea, photographic work, and radar calibration, in fact for almost any odd job for the fleet.

In March 1948, take-offs of jet planes from a carrier, USS *Boxer,* were successfully accomplished. "Project Sandy" set another type of record for the Navy when on 6 September 1947 a V-2 rocket was launched from the deck of USS *Midway,* the first time a large bombardment rocket had been fired from a ship at sea.

The position of the United States as a great world power with commitments in many areas has required not only occupation troops in parts of the Far East and Europe but also naval forces to support them. Carriers have visited ports in friendly nations, and a carrier task group completed a 'round-the-world voyage that included stops in Australia, China, Malaya, Ceylon, Arabia, the Mediterranean, England, and Norway. These activities are in the great tradition of the United States Navy, maintained since the days when sailing vessels carried the American flag across the seven seas.

OFF TO LITTLE AMERICA
The USS *Philippine* Sea (CV47) leaves for the Antarctic with the 1947 Navy expedition.

ORGANIZATION AND ADMINISTRATION

Major Divisions

The major divisions of the naval aviation organization parallel those of the Naval Establishment as a whole. Within the Navy Department, the Shore Establishment, and the Operating Forces are units that are concerned with aviation. In this section, the naval aviation organization is only briefly described. A detailed description would show the complete coordination that exists within the naval aviation organization itself and the extent to which it is integrated into the entire Naval Establishment.

Navy Department

In the Navy Department, the Assistant Secretary for Air, the Deputy Chief of Naval Operations (Air), and the Bureau of Aeronautics have responsibilities connected with naval aviation.

The functions of the Assistant Secretary for Air and DCNO (Air) pertain in general to the coordination of aviation activities within and outside the Service. Specifically, DCNO (Air) must insure that the Service itself prepares and supports an aviation organization ready to perform the tasks set by the Chief of Naval Operations; the Assistant Secretary for Air deals with matters affecting the Navy and the nation.

The Bureau of Aeronautics is mainly concerned with providing aircraft and related equipment. (See section on the Bureau of Aeronautics in Chapter 9.) BuAer also maintains all aeronautical activities ashore or afloat. In connection with the accomplishment of its mission, the bureau frequently works in close cooperation with other bureaus and offices; for example it works with the Bureau of Ships in matters concerning design, procurement, and installation of aeronautical features and facilities in ships; and with the Bureau of Ordnance in aviation armament matters.

Aviation Shore Establishments

The naval aviation shore establishments include Navy and Marine Corps air bases commands, air stations, and less extensive facilities; the Naval Air Training Command and its functional training commands; the Naval Airship Training and Experimental Command; the Aviation Supply Office (a BuAer-BuSandA activity), supply depots and annexes; and certain naval air details which provide services for special missions, either overseas or in other bureaus, offices, and agencies.

Under the technical control of the Bureau of Aeronautics there are also certain other special activities such as the Naval Air Test Center and the Naval Air Material Center.

Fleet Aviation

Two air forces comprise fleet aviation: Air Force, Atlantic Fleet, and Air Force, Pacific Fleet, and their subordinate commands. The Commander Air Force, Atlantic Fleet (ComAirLant) and Commander Air Force, Pacific Fleet (ComAirPac) have broad responsibilities in fleet aviation. Briefly, they establish policies pertaining to the organization, maintenance, and employment of fleet aviation; they study the strategic situation and make recommendations concerning the distribution of naval air forces; they advise the fleet

BATTLE-DAMAGED CARRIER
The carrier Suwanee made her own way back to the States in spite of the tremendous damage she had received. Photographs of the damage were flown ahead of the ship and when she arrived at Puget Sound Naval Shipyard, workmen were all ready to start repairs.

commanders on air operations. In addition they are responsible for overhaul and maintenance of aircraft, for the distribution of aircraft and supplies, for squadron training, and for the preparation of operational doctrines for all types of aircraft. In all these duties they maintain close liaison with DCNO (Air) and the Bureau of Aeronautics.

The headquarters of ComAirLant is at the Naval Air Station, Norfolk, Virginia; and of ComAirPac at Pearl Harbor.

As mentioned before, there are subordinate commands under each of the major commands. The subordinate commands are staging and training areas, with cognizance over all personnel, aircraft, and vessels assigned to them.

Smaller units of the fleet aviation organization are the carriers; the carrier aircraft groups and squadrons; fleet air wings, which may include both land-based and tender-based patrol squadrons, amphibious squadrons, and photographic squadrons. There are also utility wings and logistic support wings.

The following description of the Naval Air Training Command indicates the broad area covered by just one of the phases of naval aviation. This section demonstrates, too, how thorough is the training given by the Navy to its aviation personnel and how carefully it selects these men.

NAVAL AIR TRAINING COMMAND

Flight Training Program

Commanded by the Chief of Naval Air Training at Pensacola, Florida, the Naval Air Training Command (see chart) consists of four functional commands:

Naval Air Advanced Training—Hdqrs. at Corpus Christi, Texas.
Naval Air Technical Training—Hdqrs. at Memphis, Tennessee.
Naval Air Basic Training—Hdqrs. at Pensacola, Florida.
Naval Air Reserve Training—Hdqrs. at Glenview, Illinois.

The NATraComd is charged with three distinct programs:

1. Flight Training: Naval aviators for fleet.
2. Technical Training: Aviation ratings for assignment throughout the Navy.
3. Reserve Training: Maintenance of readiness of Naval Aviation Reserve personnel.

This section covers, in a broad manner only, the Flight Training Program as presently administered by the Chief of Naval Air Basic Training and the Chief of Naval Air Advanced Training.

The Navy defines a naval aviator as a well-rounded naval officer, not simply a pilot. Of necessity he develops rapidly and exercises very early in his career all the functions of leadership and command, based on a wide knowledge of modern warfare. To that end, Training Command standards are, and must be, high enough to present a fair challenge to the best capabilities of American youth.

The Navy knows that the fundamental requirements for producing the best possible naval aviators are high-caliber students, efficient educational methods, experienced skilled instructors, and the best in equipment. Accordingly, every effort is continually being directed toward fulfilling these requirements. For example, the Air Force and Navy cooperated on a project to determine the best methods for initially selecting the most apt flight students. This resulted in flight aptitude ratings which are administered to prospective candidates for flight training. Constant research is conducted to improve the methods. Research is also conducted in educational methods to improve the quality of ground instruction and the learning processes of the students. The Office of Naval Research, Special Devices Center, contributes to ground and flight training by developing and providing new, up-to-date special synthetic devices to be used for instructional purposes and aid in the students' learning.

There are three definite phases of advancement in Naval Air Training: Pre-Flight Training, consisting solely of ground training; Basic Training, including primary and basic flight as well as ground training; and Advanced Training, wherein the student pilot be-

FLIGHT SYLLABI OUTLINE FOR BASIC TRAINING

PRIMARY—9 WEEKS SNJ—47 HOURS	The first half of this phase devoted to preparing the student for solo. Continues with dual and solo flights designed to increase student's precision in basic maneuvers.
ACROBATICS—INSTRUMENTS— 8 WEEKS; SNJ—47 HOURS	Introduction to acrobatics and a continuation of developing precision in basic air work. Basic instrument flying introduced, including radio range work. Also, two one (1) hour night flights.
TACTICAL—8 WEEKS SNJ—66 HOURS	Emphasis on formation and gunnery flights, including night formation flying. Primary combat techniques and cross-country navigation introduced. Continuation of basic flight techniques to develop skill.
CARRIER QUALIFICATION— 3 WEEKS; SNJ—13 HOURS	Qualification of the student for carrier operation. Practice carrier landings are made on the field. At the conclusion of this phase the student makes a minimum of six landings aboard an aircraft carrier.

ADVANCED TRAINING

CARRIER PLANE TRAINING—14 WEEKS
F6F OR F4U OR TBM—116 HOURS

Students selected for carrier plane training specialize in one of the above type aircraft. The student is prepared for the fundamentals of fleet operation so that he will be able to take his place in a fleet carrier squadron with as little additional transition as possible. Time received in various phases is roughly as follows, with slight variations between types:

1. Familiarization	13 hours
2. Instruments	21 hours
3. Formation	12 hours
4. Navigation	6-10 hours
5. Gunnery	50-54 hours
6. Tactics	10 hours

SERVICE TYPE CARRIER QUALIFICATION
2 WEEKS; TYPE—9 HOURS

Similar to Basic Carrier Qualification but in service type. Minimum of six (6) landings on carrier.

CRUISER—BATTLESHIP TRAINING
4 WEEKS; SC—25 HOURS

A very small fraction of students received this brief course in scout and observation type operations.

TWIN-ENGINE INDOCTRINATION
4 WEEKS; SNB—21 HOURS

All students proceeding to multi-engine training receive twin-engine familiarization, including night and instruments.

PATROL PLANE TRAINING—14 WEEKS
PBM OR PV OR PB4Y 150-155 HOURS

The student now specializes in one of the above listed types. Time received in various phases is roughly as follows:

1. Familiarization	47 hours
2. Instruments	43 hours
3. Navigation	36-50 hours
4. Gunnery and Tactics	12-28 hours

Emphasis is placed on developing the student as a well qualified co-pilot for fleet operational duty. Refresher students enter the training program during this phase and are developed as prospective patrol plane commanders.

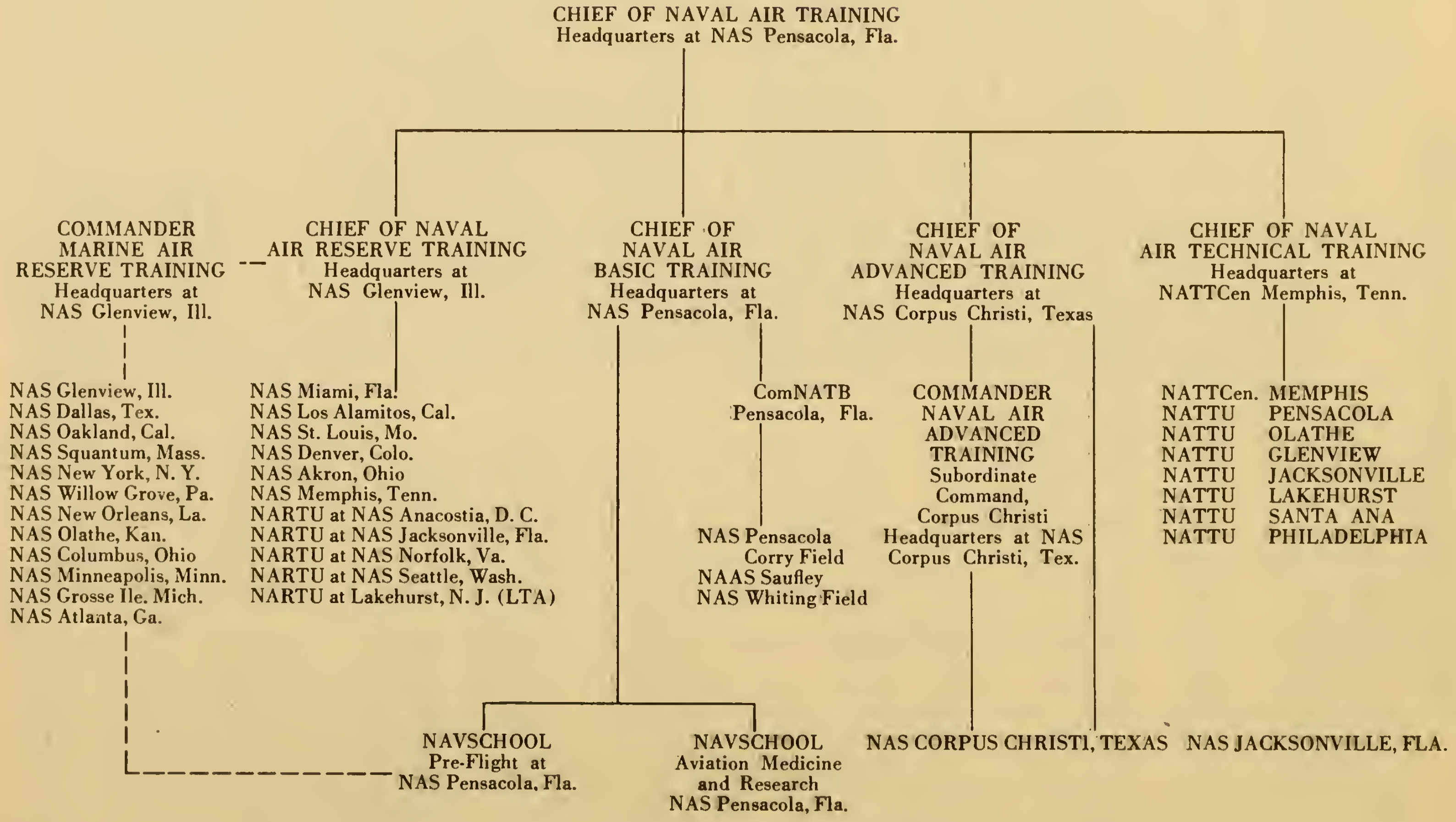
DESCRIPTION OF AIRCRAFT

SNJ: The North American "*Texan*," a single-engine two-seat basic training airplane.
F6F: Grumman "*Hellcat*."
F8F: The Grumman "*Bearcat*," a single-engine single-seat service type fighter.
F4U: The Chance Vought "*Corsair*," a single-engine single-seat service type fighter and attack plane.
TBM: Grumman "*Avenger*."
PBM: The Martin "*Mariner*," a twin-engine multi-seat longe range patrol bomber seaplane.
PV: The Lockheed "*Harpoon*," a twin-engine multi-seat patrol bomber landplane.
PB4Y: The Consolidated "*Privateer*," a four-engine long range patrol bomber landplane.
SC: The "*Curtiss*" single-engine single-seat scout seaplane. Battleship or cruiser based.
SNB: The "*Beechcraft*" twin-engine multi-seat trainer.

GROUND SYLLABI OUTLINE FOR NAVAL AVIATORS

SUBJECT	HOURS						DESCRIPTION
	Pre-Flight	*Basic*	*Advanced*		*Total*		
			*SE**	*ME***	*SE**	*ME***	
AEROLOGY	36	52	17	17	105	105	A course designed to enable pilots to recognize and evaluate weather conditions and use this information to minimize weather hazards to flight.
AIR SUPPORT			8	0	8	0	Introduction for carrier pilots to the problems of air support during amphibious operations.
CIVIL AIR REGULATIONS		6	6	6	12	12	A fundamental knowledge of rules and regulations of Civil Aeronautics Administration.
COMMUNICATIONS	67	23	9	9	99	99	Trains student to receive and send radio telegraphy and flashing light; a knowledge of flags and pennants, correct radio voice procedure, and importance of communication security.
ELECTRONICS		7	18	18	25	25	A basic knowledge of and ability to use electronic devices.
ENGINEERING	44	41	43	59	128	144	A general engineering background leading to specific engineering knowledge of aircraft the student flies.
ESSENTIALS OF NAVAL SERVICE	50	15	16	16	81	81	To instill in student the responsibilities of a naval officer; traditions and customs of the Navy; and a fundamental knowledge of the Navy.
FIGHTER DIR.			10	0	10	0	A basic knowledge of fighter direction language and tactics.
FLIGHT PHYSIOLOGY			9	9	9	9	A study of oxygen in flight, night vision, operational fatigue, first aid for aircrew casualties and the role of the flight surgeon.
GUNNERY	16	25	30	16	71	57	Presentation for a general background of shipboard and aircraft ordnance, followed by instruction in safe, proficient use of specialized equipment.
INSTRUMENT		12	3	3	15	15	Presentation of basic mechanics, uses, limitations and theory of instruments used in instrument flying.
INSTRUMENT TRAINER		20	8	8	28	28	To prevent fundamental instrument techniques and to develop instrument-flying skill through use of ground trainer.
MILITARY	56				56	56	To prepare student to understand functions of military drill, inspections, ceremonies, parades; and to indoctrinate him in exercise of command.
NAVIGATION	150	152	20	47	322	349	A course designed to make a pilot proficient in aer. nav.
PHOTOGRAPHY			5	5	5	5	A program designed to give student a basic understanding of theory and military uses of photography.
PHYSICAL TRAINING	165	85	24	24	274	274	To teach student recreational sports that will have a carryover value in his naval career; to develop his sense of sportsmanship; and to maintain his physical alertness.
PRINCIPLES OF FLIGHT	21				21	21	To acquaint student with theory and aerodynamic principles of flight.
RECOGNITION			10	10	10	10	Introduction to methods of recognition training.
SAFETY		12	7	7	19	19	To imbue in student the importance of safety in flight.
SUPPORT OF FLIGHT		—	—	—	—	—	Pre-flight and post-flight lectures, discussions, and briefs that precede all flights and are of utmost importance to the success of each particular flight.
SURVIVAL	8	20	8	8	36	36	To show and train the student how to survive various types of emergencies and situations.
TACTICS			8	8	8	8	Introduction to the tactics of a particular type or purpose aircraft.

* SE—Single Engine ** ME—Multi-Engine


CHIEF OF NAVAL AIR TRAINING
Headquarters at NAS Pensacola, Fla.
COMMANDER MARINE AIR RESERVE TRAINING
Headquarters at NAS Glenview, Ill.
NAS Glenview, Ill.
NAS Dallas, Tex.
NAS Oakland, Cal.
NAS Squantum, Mass.
NAS New York, N. Y.
NAS Willow Grove, Pa.
NAS New Orleans, La.
NAS Olathe, Kan.
NAS Columbus, Ohio
NAS Minneapolis, Minn.
NAS Grosse Ile. Mich.
NAS Atlanta, Ga.
CHIEF OF NAVAL AIR RESERVE TRAINING
Headquarters at NAS Glenview, Ill.
NAS Miami, Fla.
NAS Los Alamitos, Cal.
NAS St. Louis, Mo.
NAS Denver, Colo.
NAS Akron, Ohio
NAS Memphis, Tenn.
NARTU at NAS Anacostia, D. C.
NARTU at NAS Jacksonville, Fla.
NARTU at NAS Norfolk, Va.
NARTU at NAS Seattle, Wash.
NARTU at Lakehurst, N. J. (LTA)
CHIEF OF NAVAL AIR BASIC TRAINING
Headquarters at NAS Pensacola, Fla.
ComNATB
Pensacola, Fla.
NAS Pensacola
Corry Field
NAAS Saufley
NAS Whiting Field
CHIEF OF NAVAL AIR ADVANCED TRAINING
Headquarters at NAS Corpus Christi, Texas
COMMANDER NAVAL AIR ADVANCED TRAINING
Subordinate Command, Corpus Christi
Headquarters at NAS Corpus Christi, Tex.
CHIEF OF NAVAL AIR TECHNICAL TRAINING
Headquarters at NATTCen Memphis, Tenn.
NATTCen. MEMPHIS
NATTU PENSACOLA
NATTU OLATHE
NATTU GLENVIEW
NATTU JACKSONVILLE
NATTU LAKEHURST
NATTU SANTA ANA
NATTU PHILADELPHIA
NAVSCHOOL
Pre-Flight at
NAS Pensacola, Fla.
NAVSCHOOL
Aviation Medicine and Research
NAS Pensacola, Fla.
NAS CORPUS CHRISTI, TEXAS
NAS JACKSONVILLE, FLA.

ORGANIZATION OF THE NAVAL AIR TRAINING COMMAND comes skilled in the operation of fleet-type combat aircraft and continues his ground training in essential subjects. The flow of students is predicated on an 18-month period for the completion of the entire syllabus.

According to the requirements of the fleet, definite proportions of the pilot output are channeled through various aircraft type specialties in Advanced Training. There, some students become proficient in multi-engine patrol-type landplanes, some in single-engine fighter aircraft, some in attack-type aircraft, which envisage a greater use of dive-bombing, rocket, and strafing tactics, and so on. Ground school instruction is coordinated accordingly, so that in addition to basic subjects needed by all aviators and naval officers, a particular specialty in the air is supported by specialized instruction on the ground.

All through pilot training, constant and particular emphasis is placed on physical training. This takes the form of required participation in varied sports common to the experience and natural inclination of most young American men. Military discipline also is a necessary adjunct to daily activities. Each student learns to carry out orders as a first step in the process of learning to give them.

RADIO-CONTROLLED TARGET DRONE
A radio-controlled target drone takes off from a ship's catapult. It is then flown over the task force to give the antiaircraft gunners of the fleet a warm-up for impending battles.

To describe fully the complexity of the organization necessary to produce accomplished naval aviators in today's technical age is not possible in this short review. However, it is hoped that the over-all program of flight and ground training has been outlined (see accompanying syllabi) clearly enough to indicate the scope and direction of the Naval Air Training Command effort.

Requirements

Physical. In general, the physical requirements for flight training are similar to, but somewhat more exacting than those for a commission; in particular, the eyes, ears, blood pressure, and relation between weight and height must fulfill certain more restrictive requirements.

Mental. Flight students must be of sufficient intelligence to have satisfactorily completed at least two years of college credits as a minimum requirement under certain procurement programs, and four years under other procurement programs. Passing grades in general and mechanical aptitude tests are a prerequisite for acceptance into flight training.

Methods of Training

The methods of training used in the NATraComd are the basic and fundamental steps of instruction. These are used and adapted for both flight and ground training. They are not necessarily followed in each case in the order below listed, nor does each subject or phase of instruction necessarily encompass all the methods listed below.

1. *Lectures.* Lectures are employed to introduce and amplify a subject or procedure.
2. *Class discussions.* Class discussions inculcate interest and promote understanding.
3. *Demonstrations.* Training aids and special devices are invaluable here. They fix pertinent points more firmly in a student's mind and facilitate understanding.
4. *Supervised practice.* Supervised instruction is one of the most effective methods in teaching and is the main instructional effort in flight training.
5. *Precept and example.* Set by the naval officers, who are observed by students. Understanding and insight into service life are provided, which it would

be difficult if not impossible to duplicate by any or all of the preceding methods.

Special Devices

Almost without exception, every phase of Naval Air Training uses special devices or training aids. These range in size and complexity from huge celestial navigation trainers, which require a building of their own, to small ship models used in teaching recognition. A few examples of special devices and training aids are noted and described below. It would be impractical to list and discuss all that are used.

The celestial navigation trainer is housed in a silo-like structure about 30 feet in height. In it a pilot, navigator, and radioman simulate long-range flights, navigate by celestial fixes, and get excellent training in all aspects of celestial navigation.

The Link trainer, probably one of the best known of the special devices, is used to teach basic instrument-flying techniques to the student naval aviator. Teaching of this type is followed by practice in the air using another special device consisting of a transparent amber plastic covering for the inside of the plane's windshield, and blue goggles for the pilot. This combination effectively cuts off all vision outside the plane but allows the pilot to read his instruments. Any occupant of the aircraft not wearing blue goggles can see normally through the amber cover. (The Link trainer is soon to be replaced by Device 1-CA-1, a new type of instrument trainer.)

Operational flight trainers are refinements of basic instrument trainers. These simulate actual operational-type aircraft and are extremely realistic. One of their uses is to familiarize the pilot with a specific type of aircraft while practicing instrument flying. Emergencies can be introduced by the instructor, thus giving the pilot additional valuable training. In OFT's of a multi-engine type aircraft, members of the crew, such as the radioman and navigator, work with the pilot and develop a high degree of teamwork.

The list goes on and on—navigation, gunnery, instrument flying, radar, communications, recognition—all these subjects and others are taught more swiftly and economically through the use of training aids and special devices.

MODEL DESIGNATION OF NAVAL AIRCRAFT

Explanation

Before proceeding further, some information is needed to understand the system used by the Navy for model designation.

A series of letters and numbers is used to designate naval aircraft in order that one may tell at a glance the general type, special mission, the manufacturer, the manufacturer's model, and the operating characteristics. For example, "XF8F-3N" immediately tells a naval officer that the plane is a fixed-wing, pilot-carrying, fighter airplane designed for all-weather operation. He further knows that it is the eighth fighter model built by Grumman for the Navy, the second modification of the model, and that the plane is still in an experimental status.

F9F-2, PANTHER

This is how he does it. The F8F is the basic designation. The first letter indicates class—F for fighter. The figure 8 indicates that it is the designer's eighth series and the letter after the figure 8 denotes the designer, who in this case is Grumman with the manufacturer's designator F. Other classes of planes are attack (A), patrol (P), transport (R), training (T), and drone (D). Some of the more important designers of naval aircraft are Douglas (D), McDonnell (H), Chance Vought (U), and Consolidated (Y).

Following the designer designator is the model or modification number. The first model was designated the F8F-1, and the first modification of it was designated the F8F-2. The figure 3 following the designer designator indicates that this is the second modification of the series.

To further distinguish naval aircraft for special missions, a letter is placed after the modification number. This letter is called the suffix letter. The N that appears in the designation F8F-3N indicates that it is an all-weather operating version. Other suffix letters are E (special electronics version), P (photographic), Q (countermeasures), and W (air warning version). The X preceding the entire designation means that it is still in an experimental status.

For other than fixed-wing piloted aircraft, a type letter is used, and it precedes the class letter. These letters are H (heavier-than-air, rotary wing), K (pilotless aircraft), M (guided missiles), and Z (lighter-than-air).

The first helicopter built by McDonnell is an HRH-1, and the first modification of the second model of a pilotless aircraft built by the Radioplane Company is KD2R-2.

Examples of Designations

F2H-1.	F Class (Fighter)	2 Designer's Second Series	H Designer: McDonnell	1 First Model of Series	
HRP-1:	H Type (Helicopter)	R Class (Transport)	P Designer: Piasecki	1 First Model of Series	
KD2R-2:	K Type (Pilotless Aircraft)	D Class (Drone)	2 Designer's Second Series	R Designer: Radioplane	2 First Modification
AD-2W:	A Class (Attack)	D Designer: Douglas	2 First Modification	W Suffix Air Warning	

AIR GROUPS AND SQUADRONS—TYPICAL ORGANIZATION

Air Groups

Printed matter is static—naval aviation is not. In reading the sections that follow, it should be borne in mind that the changes constantly occurring in the field of naval aviation make any discussion of organization, of planes, and of their equipment subject to inaccuracies within months, perhaps even within weeks, after it appears. The student who is seriously interested in making a career of naval aviation will be constantly on the alert for new developments in his chosen field.

CVB. The air groups aboard the CVB's are composed of 5 squadrons with 104 pilots and 104 planes. The air group commander (AGC) is a senior commander and a veteran of many years' flying experience. As the tactical leader of the air group, he leads a separate division of planes known as the command division and made up of the AGC and three other pilots. Each of these three pilots is trained in a special field. Two are trained photographic pilots and fly photographically configured fighter aircraft. The third pilot flies an attack plane that is equipped for special search or countermeasures. The air group commander flies a fighter. Each of the 5 squadron commanders is a lieutenant commander and leads a squadron of 20 pilots and planes. The fighter squadrons are assigned F2H, FJ, F8F, or F4U aircraft. The attack squadrons are assigned AD, TBM, or SB2C aircraft.

CV. The composition of the air groups aboard the CV's follows the same pattern. The air group commander's division in a CV group is the same as that in a CVB group. The AGC is usually a commander and the squadron commanders are lieutenant com-

F4U'S—NAVY VOUGHT CORSAIRS

manders. However, the 5 squadrons aboard the CV have only 16 pilots and planes each, a total of 84 pilots and planes.

CVE. The escort carrier air groups are composed of two squadrons: one fighter and one attack. The fighter squadron has 9 planes and the attack squadron, 18. In the fighter squadron there are 14 pilots, and in the attack, 27. One squadron commander is usually a commander; the other is a lieutenant commander. The commander is the air group commander and has additional duties as commanding officer of one squadron. The escort carrier group does not have a separate command division.

The Marine Corps has squadrons assigned to four CVE's. The primary mission is landing support and, because of this mission, they are assigned all fighter aircraft. The Marines use F4U's in their CVE groups. The Marine CVE groups differ from the Navy CVE groups in several respects: the Marines have 24 planes and 25 pilots; there is only one squadron aboard a CVE; they do not have an air group commander as such; and the primary mission of the Navy CVE group is antisubmarine warfare. The senior aviator is the squadron commander and is usually a lieutenant colonel or a colonel.

In addition to the aforementioned complements for both CVB and CV air groups, there are special units that may be assigned to the carriers from time to time. These units are composed of VF night, VA night, VA countermeasures, or VA special search aircraft. These special units have four to eight planes each. The VF night has eight and the others have four each. These units are assigned to and operate with the regularly assigned units aboard the carrier during maneuvers and missions in which such services are required.

CVL. The light carrier group is composed of two squadrons and is assigned to the Operational Development Force for carrying out special projects. Usually, the fighter squadron is composed of 30 aviators and 30 aircraft, while the attack squadron is composed of 18 aviators and a similar number of aircraft. The fighter squadron is assigned F8F and F4U aircraft, and the attack, TBM's and AD's. The air group commander generally holds the rank of commander and has additional duty as commanding officer of the fighter squadron. The commanding officer of the attack squadron has the rank of lieutenant commander. The air group commander has a staff of four officers: a landing signal officer who is an aviator; and a medical officer, maintenance officer, and electronics officer, all of whom are ground officers. The AGC of the CVL group does not have a command division as does the AGC of the CVB and CV groups.

ROCKET-LADEN WING OF A HELLCAT

Seen beneath the wing of an F6F Hellcat, ordnancemen aboard an escort carrier of a task force prepare bomb loads and rockets for the fliers. TBM Avengers line the deck in the background.

Squadrons

There are several types of patrol squadrons. Their designations usually indicate the type of operation in which they are intended to function. One such type is the VP-AM, amphibious patrol squadron. The VP-AM has a complement of 25 pilots who fly PBY-5A's. The squadron commander of this type VP squadron is usually a lieutenant commander.

VX. There are three VX (experimental) squadrons now operating in the United States Navy. They are: VX-1, the ASW development squadron; VX-2, the aircraft development squadron (ordnance); and VX-4, the aircraft development squadron (airborne early warning). As the name implies, these are all experimental and research squadrons. VX-1 is commanded by a captain (a naval aviator) and has a complement of 50 pilots. VX-2 and VX-4 are commanded by commanders and have complements of 43 and 28 pilots respectively. In addition to VX-4, there is a second airborne early warning development squadron. This squadron is VPW-1 (airborne early warning squadron ONE). Both airborne early warning squadrons (AEW) have a complement of 28 pilots and 6 PB-1W's (B-17's).

HU. In addition to the three experimental squadrons, there are two helicopter utility squadrons. HU-1 and HU-2 are both commanded by commanders and are assigned 23 and 35 pilots respectively. Their mission is to train pilots on helicopter operations and to furnish helicopter service to the fleet.

VO. Observation planes are no longer assigned to cruisers and battleships as permanent units. A unit of two pilots and aircraft are usually assigned to the CA, CL, or BB whenever observation services are needed. This unit is drawn from one of the two observation squadrons. The two observation squadrons presently in commission are composed of 16 and 10 SC aircraft each. The squadron commander of each is a lieutenant commander.

VCN. The night composite squadrons are composed of approximately 65 fighter and attack pilots. These squadrons are commanded by a captain, and provide night aircraft services to carriers as they are needed. These two night squadrons usually fly F6F-5N's and TBM-3Q's.

VAW. The assignment of aircraft from carrier airborne early warning squadrons is handled in the same manner as the VCN aircraft. In each of the two VAW squadrons, there are at present teams of four aircraft. When the services of an AEW team are required, the team is assigned from either Atlantic VAW-2 or Pacific VAW-1. Each squadron has a complement of 24 TBM-3W aircraft and 60 pilots (30 of whom are trained as CIC officers) and 6 electronics officers.

MARINE CORPS AVIATION

Mission

In order to understand Marine Corps aviation it is first necessary to understand the mission of the Marine Corps as a whole. Section 206(c) of Public Law 253 establishes the mission of the Marine Corps as follows:

> The United States Marine Corps within the Department of the Navy, shall include land combat and service forces *and such aviation as may be organic therein.* The Marine Corps shall be organized, trained, and equipped to provide fleet marine forces of combined arms, *together with supporting air components,* for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign.

From the above, it is apparent that the mission of Marine Corps aviation is to support the Fleet Marine Force. This mission is accomplished initially by operating from carriers and later from positions established ashore, and is broken roughly but distinctly into three progressive phases: air superiority, isolation of battlefield, and direct support of ground troops.

By *air superiority* is meant the elimination of enemy air power to preclude its use against our ground and naval forces, communications, and supply bases.

This process is directed toward reducing the offensive power of enemy air to ineffectiveness.

Isolation of the battlefield includes the attacking of enemy communications, shipping, and bases to prevent his reinforcing or resupplying his own troops on the battlefield, while our own forces carry on the campaign. In this phase, the enemy defensive air power must be reduced to accomplish the task.

Direct support of ground troops is the employment of attack aircraft against enemy ground positions in the nature of airborne artillery in order to facilitate the advance of our own ground forces.

From the shore bases, Marine Corps aviation also operates with, and furnishes protection for the vessels of the fleet and amphibious forces within the landing area until withdrawn or replaced by air force units. It also furnishes air defense of small naval bases where elements of the air force are not present. As a secondary role, these Marine air units are available to augment or replace naval air units aboard the carriers.

Organization

The present organization of Marine Corps aviation is tailored to the accomplishment of its mission and accordingly is divided into those components comprising the aviation units of the Fleet Marine Force, shore establishments, and administrative units necessary for the support of the Fleet Marine Force units. At the present time there are two Fleet Marine Force aviation area commands: Aircraft, Fleet Marine Force, Atlantic, at the Marine Corps Air Station, Cherry Point, North Carolina; and Aircraft, Fleet Marine Force, Pacific, at the Marine Corps Air Station, Ewa, Oahu, T. H. The shore and supporting establishments consist of the Division of Aviation, Headquarters, U. S. Marine Corps; four Marine Corps air stations (Cherry Point, Quantico, El Toro, and Ewa); an air facility, schools, and special assignments. In time of war, the Fleet Marine Force area commands, in addition to the normal area command functions, would assume the functions of training and the replacement of personnel in combat units.

SUICIDE PLANE GOES DOWN
Under fire from the starboard batteries of a baby flat-top, a Jap kamikaze plane fails in its attempt to damage the ship.

Marine Aircraft Wing

The largest Marine tactical aviation command organized for combat operations is the Marine aircraft wing. Experience gained in the past, and especially during operations in World War II pointed out the desirability of having an air-ground team to carry out the mission of the Marine Corps in general and Marine Corps aviation in particular. This team as currently composed consists of tactical aviation units of wing strength to support tactical ground units of division strength. The planned peacetime strength of the Marine Corps contemplates two combat ready divisions, and consequently two aircraft wings are necessary for their support. At present, the First Marine Division based at Camp Pendleton, California, is supported by the First Marine Aircraft Wing based at the Marine Corps Air Station, El Toro, California. On the east coast, the Second Marine Division based at Camp Lejeune, North Carolina, is furnished corresponding support by the Second Marine Aircraft Wing, located at the Marine Corps Air Station, Cherry Point, North Carolina.

The present peacetime organization of a Marine wing consists of the following units:

Wing headquarters squadron
Wing service squadron
One photographic squadron
One transport squadron
Two night fighter squadrons (to be redesignated all-weather squadrons)
Two Marine aircraft groups, composed as follows:
  Group headquarters squadron
  Group service squadron
  Three day fighter squadrons
One air control group consisting of:
  One tactical air control squadron
  Two Marine ground control intercept squadrons

Day fighter squadrons are composed of 24 single-engine fighter-type aircraft. Night fighter squadrons are either twin engine or single engine, the former having 12 aircraft and the latter 24. Transport squadrons may have either twin-engine or four-engine aircraft; in each case, the number of planes is currently 15. Organizational expansion would presumably provide for an increase in the number of both day and night fighter squadrons, with the possible formation of a night fighter group and the organization of transport groups to accommodate an increase in the number of transport squadrons. To support the possible increase in units it would be necessary to reactivate two additional air stations.

The above description outlines the peacetime organization of a Marine wing. Wartime organization would be along the same general organizational lines but on a larger scale, with increases in the number of groups, and a probable large increase in the number of personnel in each unit. Correspondingly, the number and size of shore and supporting establishments would be increased to accomplish the mission under wartime conditions.

Marine Carrier Groups

At times during the past war, Marine aviation found itself in a position in which it was unable to carry out its primary mission of supporting the ground units of the Fleet Marine Force. This was particularly true in the campaigns that went on during the seizure and occupation of the Central Pacific islands. During this time, Marine aviation was entirely land based, and unlike the situation existing in the Solomons campaigns, the shore bases were too distant from the target area, thereby leaving the support of the ground Fleet Marine Force to naval aviation, while Marine aviation was performing Army Air Force functions in other areas. Prior to the end of the war, however, Marine carrier groups were formed and actively operated from carriers. In establishing postwar Marine aviation, the Chief of Naval Operations approved the provision that all Marine Corps tactical combat aircraft squadrons be organized, equipped, complemented, and trained for operations from aircraft carriers. At the present time, four CVE-class carriers have been designated for Marine aviation units. In wartime this number of CVE's would be augmented or larger type carriers assigned in order that Marine aviation might accomplish its mission with the greatest mobility.

Marine Corps Aviation Reserve

The foregoing paragraphs have dealt with the Regular components of Marine Corps aviation. In the event of an emergency, the expansion to a wartime organization would be initiated by augmentation from the

Marine Corps Aviation Reserve, which is in turn composed of the Organized Reserve and the Volunteer Reserve.

The Organized Reserve consists of aviation units organized along the lines of regular squadrons, the personnel of which receive their training at drill periods and annual training maneuvers. The same type of equipment is used by these Organized Reserve squadrons as is used by the Regular units. Over-all supervision and responsibility for this program are vested in the Marine Air Reserve Training Command located at the Naval Air Station, Glenview, Illinois. The Organized Reserve currently consists of 27 fighter squadrons and 8 ground control intercept squadrons located at various naval air stations throughout the United States. Present expansion plans contemplate a considerable increase in the number of these units. The current Organized Reserve is composed of approximately 1,500 officers and 4,500 enlisted men.

The Organized Reserve squadrons are well trained. A majority of the officer-members served in World War II and hence have a broad knowledge of aviation tactical work.

The Volunteer Reserve is that component of the Reserve whose members do not belong to a tactical unit. They make up a large proportion of the skills we would need in case of mobilization. At present, the Volunteer Reserve consists of approximately 9,000 officers and 5,000 enlisted men. In addition it is estimated that 10,000 former Marine enlisted men will be available if required.

Current Trends in Marine Aviation

At the present time Marine Corps aviation combat units are equipped with an all-purpose fighter, the F4U Corsair, which during the latter stages of the past war capably performed all three phases of Marine aviation's mission from both land and carrier bases. Current aviation trends are changing in that better attack planes are being developed, and present jet-powered intercept fighters, necessary to maintain air superiority, are not adaptable to close air support or long-range combat operations due to their limited radius of action. Thus an interim period is indicated in which two types of aircraft, that is *attack* and *fighter*, must be employed to accomplish Marine aviation's mission.

XHRP-1, HELICOPTER
This helicopter can carry eight passengers and two pilots.

The mission of Marine combat transport squadrons is to provide air lift and air supply for the Fleet Marine Force in the field. Transport-type aircraft designed specifically as carriers for combat ground organizations and their organic equipment are now in the development stage.

Marine Corps aviation is also experimenting with two-place helicopters as artillery spotting planes and with assault helicopters designed for ship-to-shore movement and replacing or supplementing amphibious vehicles now used to transport troops from ship to shore.

In the field of all-weather operations, Marine aviation's mission is, through the aid of instruments and electronics devices, to be able to go out in any kind of weather, day or night, and successfully provide direct support and air defense of the Fleet Marine Force. Night fighter squadrons are developing all-weather tactics with this mission in mind.

In the electronics field, Marine aviation is keeping abreast of the latest developments. Ground control intercept squadrons are now provided with the best available radars and are in line for each new improvement as it is completed. It is expected that equipment will soon be in use which will provide airborne early warning, ground control of support aircraft, and vastly improved ground control interception.

Conclusion

In conclusion, it is emphasized that Marine aviation is close support aviation, a weapon that is as vital a part of the air-ground Fleet Marine Force team as is the artillery and infantry. It accomplishes a specialized function which in no way infringes on that of the United States Air Force. All combat units are equipped with carrier aircraft, and all units are trained for carrier operations and rotate on that duty. Utility and transport aircraft are limited to those required for internal administration and for the provision of combat air services for the Fleet Marine Force. Its personnel train with and fight with the ground troops of the Fleet Marine Force, operating initially from carriers and later from positions ashore, when necessary. It provides close-in, active, effective, and direct support of ground troops in front-line positions. It is a major component of the Fleet Marine Force team which cannot be replaced by an aviation organization not so trained and integrated.

AIRCRAFT IN ANTISUBMARINE WARFARE

Types of Operations in Antisubmarine Warfare

The mission of antisubmarine warfare (ASW) may be stated thus: To deprive the enemy of effective use of submarines.

Operations necessary to successful accomplishment of this mission may be divided into four types:

1. Strategic bombing and mining to reduce effectiveness of building yards, repair facilities, and to prevent egress from bases are the most direct and effective ways of accomplishing the mission of antisubmarine warfare.
2. Location and destruction of the enemy submarines (as in killer-group operations) in those areas into which their entry has not been, or could not be prevented.
3. Protection of certain fixed geographical water areas and the included units and installations (as in harbor defense) to prevent penetration or attack by enemy submarines.
4. Protection of small moving areas and the included units (as in escort of convoy) to prevent penetration or attack by enemy submarines.

Fulfillment of the above will depend upon effective coordination of aircraft with all other types of antisubmarine units, including surface craft, lighter-than-air craft, and submarines. A high degree of understanding of the principles of antisubmarine operations and weapons employed by other forces must be maintained.

Aircraft Used in ASW

Aircraft resources for antisubmarine warfare include a variety of types. Long- and medium-range patrol aircraft may be employed in many types of antisubmarine missions. Range, endurance, and navigational ability of this type of aircraft especially adapt it for long-range operation. Length of flight normally is somewhat limited by personnel fatigue as well as by fuel exhaustion. A reasonable operational limit is thus in the neighborhood of 12 or 13 hours, although some aircraft are capable of endurances up to 18 hours or more. Efficiency of antisubmarine search falls off sharply after 10 to 12 hours, however, and the additional endurance is called upon only in emergencies, such as the exploitation of a contact made late in a flight.

AIR-SEA RESCUE
A demonstration of air-sea rescue with a Marine Sikorsky HO3S helicopter.

Antisubmarine offensives and aerial screening operations in many sea areas will by their nature be restricted to carrier-based aircraft. Attack planes, by reason of medium range and large ordnance-carrying capacity, are well adapted to antisubmarine search and attack. Carrier-based fighters may be employed in conjunction with bombers to offer protection against air attack, support with automatic weapons, or, when equipped with antisubmarine rockets or other potentially lethal weapons, for delivering destructive attacks. A flight of four hours is probably optimum for ASW operation by present carrier types, on the same considerations as those offered above for the patrol aircraft.

Inshore patrol planes of the scout bomber or scout observation types may afford antisubmarine protection near land areas. Such aircraft are frequently restricted by modest range and endurance and limited ordnance-carrying capacity, but are useful in limiting enemy submarine operating areas and in inhibiting submarine reconnaissance.

In certain areas, lighter-than-air craft, offering the advantage of special tracking equipment and capabilities, will be available for ASW operations.

With the development of improved models of the helicopter, and of special gear and tactics for its employment, that type of plane may become an important antisubmarine aircraft.

The new submarines have caused radical changes in the employment of aircraft in antisubmarine warfare. In the past, the big advantage of aircraft was the rapid rate at which a large area could be searched. A 200-knot aircraft with the best wartime antisubmarine radar, the APS-3 or APS-15A, could search an area of 6,000 to 9,000 square miles per hour (in good weather) against a surfaced submarine. This same equipment in use against an exposed snorkel would produce a search rate of about 450 square miles in a calm sea, but this rate would, of course, be considerably less in a rough sea.

The range of visual detection from aircraft, under normal conditions, has been greatly reduced by the advent of snorkel, a retractable air intake and exhaust pipe that enables submarines to run on their diesels at periscope depth, charging their batteries while submerged. For practical considerations, the range of visual detection from aircraft is zero for complete submergence.

Airborne Electronic Devices

The magnetic airborne detection (MAD) devices when used against submarines at shallow depth produce a swept path of 900 to 1,200 feet. This in terms of square miles per hour is little if any better than that of a fast surface craft sonar search. Because of its limited range, MAD is not generally classed as a device for open area searches, but is considered for use in small areas geographically or tactically defined or restricted.

Expendable radio sonobuoys, used with measured success against submarines of the last war, are rendered valueless against submarines running quietly at deep depths. They might prove useful against snorkeling submarines at close ranges, in tactical situations where high speeds are required of the submarine, or against submarines rendered noisy by attack or operational casualty.

Since World War II, a concerted program has been initiated to develop new or improved methods of detection by aircraft in order to restore to it the maximum degree of search effectiveness. Some of the more promising developments are outlined briefly below.

The effectiveness of the expendable radio sonobuoy has already been mentioned. Based on reports received from extensive fleet use, plus recommendations received from the Operational Development Force, action has been initiated to redesign this unit.

The directional radio sonobuoy was developed too late in the war to receive any appreciable fleet evaluation, but Operational Development Force results have demonstrated that in its present form it is not satisfactory for fleet use. A redesign program is underway.

In order to apply sonar detection gear to aircraft, means are being provided for submerging the soundhead in the water. Based on rather promising preliminary results, a development program is underway to procure preproduction models of an improved "dipping" type sonar for use with airships and improved helicopters. The possibility of towing an underwater soundhead by airships or helicopters is also being studied.

As previously indicated, the range of presently available magnetic airborne detection equipment (450 feet) is, in view of the inevitability of deep-diving submarines, inadequate. Efforts are now in progress to extend the range to a minimum of 1,000 feet against a 1,000-ton submarine under all conditions exclusive of extremely effective degaussing.

"EYES" OF A MODERN BATTLESHIP
Scout-observation planes are catapulted from the stern of USS *Iowa* to hunt out the enemy and spot for accurate gunfire.

Other miscellaneous methods to be or being investigated include:

1. Infra-red detection
2. Heat detection as applied to thermal wakes
3. Pulsed visible light techniques (high-power sources with extremely short duration flashes, aimed at detection of submerged submarines at periscope or snorkel depth)
4. Long-range development of methods to detect exhaust products from atomic propulsion systems.

In all types of airborne electronic ASW devices, proper training of both operating and maintenance personnel is paramount to successful applications of the equipment. The location problem verges on borderline conditions and personnel failures can, under such conditions, completely nullify otherwise useful gear. Special techniques may be involved, in such matters as in spotting of snorkel targets on scopes and in proper and accurate sound identification as required for effective use of sonobuoys and proposed sonic devices.

LIGHTER-THAN-AIR AVIATION

Background

The United States is in a fortunate position with respect to lighter-than-air craft since among our many natural resources is an abundant supply of helium which makes safe operation possible. While helium does not have the lifting power of hydrogen, its safety more than offsets this disadvantage.

The Navy operated nonrigid airships on a small scale during World War I and then pursued a development program for rigid airships until the loss of the *Akron* and *Macon* caused naval interest in airships to become dormant.

The Navy had no definite nonrigid airship (or "blimp") program until Congress included in the 10,000-plane program of 15 June 1940 provisions for 48 nonrigid airships. However, 7 December 1941 found an airship organization on paper only, with no fleet airship unit yet in service, and thus the airships in World War II were confronted with serious problems. Despite this inadequacy in numbers and modern craft, Lakehurst reported its readiness to enter convoy and patrol activities almost immediately after the declaration of war.

At the time of Pearl Harbor, the Navy had only six blimps large enough for service at sea, and there were 5,000 miles of sea frontiers of two oceans to be patrolled with just one airship base operational (at Lakehurst, New Jersey). With the declaration of war, attacks and sinkings by submarines increased at alarming rates even within sight of the American coasts. The loss in precious ships, cargoes, and lives threatened America's war effort. Ships were being sunk faster than they could be replaced. Remembering the success of blimps in World War I, commandants of coastal naval districts, who realized their usefulness, appealed to the Navy Department.

LIGHTER-THAN-AIR CRAFT
A ZPM-2 in flight at Naval Air Station, Lakehurst, New Jersey.

The Airship Organization was then expanded from 10 blimps of all types in 1941 to 168 in 1945. With this expansion, more personnel were necessary and there was an increase from 100 naval aviators (airship) to 1,500 by 1944; aircrewman strength was expanded from 100 to 3,000 by 1944. This also required an increase in ground forces from 30 officers and 200 enlisted men in 1941 to 700 officers and 7,200 men by 1945.

The Fleet Airship Organization in World War II consisted of five airship wings operating squadrons on the east coast of North America and South America from Canada through the Caribbean to south of Rio de Janeiro, Brazil, and on the west coast from Canada to Mexico, and one independent squadron operating in North Africa.

At the peak of operations, the Navy's airships were patrolling an area of about 3,000,000 square miles of the Atlantic, Pacific, and Mediterranean areas. In all, 89,000 ships laden with millions of troops, billions in United States military equipment, and billions in lend-lease supplies were airship-escorted without loss of a single vessel. In performing this task, the airship fleet made 55,900 operational flights with a total of 550,000 hours in the air. Of the airships assigned to fleet units, 87 percent were "on the line" at all times, that is, in operation—a record availability factor for military aircraft. The World War II operation cost the airship forces 83 lives and 38 airships from all causes.

In addition to its important role in submarine detection, the airship was utilized for multitudinous utility missions, embracing reconnaissance and search, minesweeping control and detection, air-sea rescue work, aerial photography, and numerous other missions.

Post-war Airship Organization

The airship program, like all other naval programs, was greatly reduced after the war; however, with the transition to peacetime operations completed, this program remains a very active branch of naval aviation. The fleet airship squadrons are under the fleet commanders and are engaged primarily in fleet ASW hunter-killer exercises.

Although airships are based at additional stations, the Naval Air Station at Lakehurst is still the center of airship activity. The Headquarters of the Chief of Naval Airship Training and Experimentation is located there, and under him a vigorous program of airship experimentation is being conducted, together with officer and enlisted LTA Training Programs.

The advantages of the Naval Air Reserve Training Program are open to Reserve officers and enlisted men qualified in lighter-than-air at Naval Air Reserve Training Units (LTA) operating under the Naval Air Reserve Training Command.

Current Airship Trends

Developments in World War II indicated a greater scope of usefulness of the nonrigid airship than was previously thought feasible. The airship is inherently well suited for carrying and operating various types of newly perfected antisubmarine detection devices. This fact makes it a valuable component of our antisubmarine forces, capable of filling the gap between what our surface antisubmarine types and our high-speed airplanes can do to combat the menace which the modern high-speed, deep-diving, long-submergence submarine has imposed. Antisubmarine units, composed of naval surface ships and naval aircraft, must be maintained and developed, and team tactics perfected to insure adequate protection of our ocean shipping in war.

In 1946, the Navy airship ZPM-1 set a world endurance record for unrefueled aircraft flight—170.3 hours. Recent refueling at sea experiments have proved that the seakeeping quality of the airship can be greatly extended.

The airship has proved an effective and valuable craft for:

Antisubmarine warfare (to detect, track, and destroy enemy submarines)
Convoy coverage (escort and antisubmarine patrol)
Convoy control (assisting rendezvous, shepherding stragglers, and relaying information by means of message drops, oral delivery, or visual communication)
Minesweeping control and mine detection (visual and magnetic location)
Magnetic airborne detector barrier patrol
Stable radar platform
Reconnaissance and search
Night and low visibility (or low ceiling) operations
Rescue operations
General utility missions related to readiness, training, and to research and development projects (observation-photography, electronics calibration, intensity measurements, testing, and operator training)

The mission of LTA organization is to continue research and development of airship equipment, improve techniques and tactics for effective antisubmarine warfare, and to train personnel in the operation of airships for this purpose in order to maintain their state of readiness.

Types and Characteristics

The Navy is presently operating two types of nonrigid airships with four models in service, namely ZT's (training airships) and ZP's patrol or fleet airships).

The general characteristics of the existing types and models are as follows:

Type and Model	*Vol. (cu. ft.)*	*Length (ft.)*	*Useful Lift (lbs.)*	*Speed (mph)*	*End. (hrs.)*	*Bombs (lbs.)*
ZTL	123,000	147.5	2,540	40	11.9	—
ZTG	196,700	192.0	3,950	40	17.0	—
ZPK	456,000	253.0	11,200	50	35.4	1,200
ZPM	725,000	297.0	16,950	50	50.5	2,400

LANDPLANE VS. SEAPLANE FOR PATROL AND TRANSPORT AVIATION

Characteristics of Patrol Plane

The patrol plane mission is global. It must be capable of carrying out its operations in any climate or geographical location; it must be able to supply positive search information over large sea areas and at an effective search rate. In performing its primary missions of patrol reconnaissance, antisubmarine warfare, and mining operations, it must be capable of developing attacks on lightly armed surface targets, and able to defend itself effectively in the event of attack. A patrol plane must also be versatile enough to perform its secondary missions of electronic screening, photographic reconnaissance, search and rescue (for seaplanes), attacks on shipping or lightly defended land targets, and administrative flights.

In the field of transport aviation, combat requirements— and hence special construction—do not necessarily apply. In this field, the ability of the airplane to discharge its tasks in the most effective manner is a question of range and payload; efficiency of one to the exclusion of the other in any type of aircraft, landplane or seaplane, renders that aircraft undesirable.

Landplane and Seaplane in Patrol Work

The requirements of high-speed search, adequate defensive armament, ease of construction, and simplified maintenance have been best met using the landplane. A landplane designed specifically for patrol work such as the Navy's Lockheed Neptune (P2V-2) is a case in point. This aircraft has an effective cruis-

NEPTUNE PATROL BOMBER

ing speed in the range of 150 knots to 200 knots, a good top speed, and excellent antisubmarine warfare patrol range (approximately 3,000 nautical miles). This performance is obtained with an effective torpedo, rocket, and machine-gun ammunition load. On the other hand, the patrol landplane cannot act as effectively in search and rescue, not being able to land and effect immediate rescue. Although landplanes are used for such work, carrying rescue boats which may be dropped by parachute, their operations are limited to providing for survival until rescue can be effected. This is however, a "one shot" method since only one boat is carried. On the other hand, the seaplane may make many landings over a wide area in performing rescue work. The seaplane is particularly suitable for search and rescue.

Naval patrol landplanes are designed to operate from minimum fields in order to fulfill their mission in global warfare. Even so, they are not so mobile as seaplanes which can base on a seaplane tender.

The landplane is better able to carry ASW electronic equipment which must be capable of searching all around the horizon. Physically locating radar scanners on seaplanes to permit surface search through 360 degrees azimuth is difficult. For the same reason, landplanes are better suited for electronic screening.

As minelayers, the large landplane operating from fixed bases is the more efficient aircraft, since large-fuselage bomb bays permit carrying more mines, loading is easier at fixed bases, and the aircraft's speed in the target area is usually higher. However, where areas to be mined are beyond the range of land-based aircraft, heavy seaplanes (VP-HS) can perform the task.

Due to the requirements for high speed, high altitude (pressurization), and long range for photographic aircraft, the landplane (VP-HL) is the more desirable aircraft. Again, where the VP-HL cannot reach the target area, seaplanes may be used to perform the tasks.

The patrol seaplane is capable of meeting the primary mission requirements, though not so effectively in the medium seaplane types in relation to speed and degree of vulnerability to attack. The heavy seaplane (VP-HS) should be able to carry out all missions even in areas where enemy air opposition is expected, since it has a comparatively high speed and good defensive armament.

The seaplane has developed slowly in design, as definitely indicated by the fact that the 1935 PBY hull had practically the same underwater body as the 1919 NC-4 aircraft. Recently, however, new hull designs have been developed which open up the possibility of seaplane designs' more closely resembling aerodynamically those of the landplane. As a result, greater speeds will be possible, thereby greatly increasing manyfold the usefulness and effective application of the seaplane to the missions for which it is best suited. The seaplane, though not so good an ASW aircraft as the landplane, may be used for ASW and convoy coverage in and around advanced base areas. As soon as a seaplane base can be established, these aircraft are ready to operate, not having to wait for landing fields to be secured and repaired or, in some cases, constructed. The seaplane is usually large and roomy, and in emergencies these aircraft have performed effectively as cargo carriers, hospital planes, and troop carriers. One should not overlook the great advantage seaplanes have in being able to operate from rivers, bays, harbors, lakes, and open water all over the world. In Arctic regions, seaplanes and amphibians may be able to operate more effectively than landplanes; several naval seaplanes have performed satisfactorily in the Antarctic.

To summarize the comparison of these two types, it can be readily seen that for the missions a patrol plane is required to perform at long range from its fixed bases, the landplane is perhaps most effective. For ease of maintenance, the landplane is far ahead by virtue of operating from fixed bases. Therefore, it is probable that the majority of patrol planes used by the United States Navy will continue to be landplanes. By virtue of its ability to operate from minimum fields, it partially overcomes the advantage of mobility enjoyed by the seaplane. The seaplane will always have a place in patrol aviation for search and rescue, advanced base operations in support of early landing operations, and the multitudinous other tasks these planes have been called on to accomplish in the past.

Landplane and Seaplane in Transport Operations

Obviously, the greatest use of air transport takes place over land masses where the landplane is more effective for reasonably short runs. In payload versus range, it has been shown that the Martin Mars compares favorably with her sisters, the large multi-engine transocean landplane transports. It is generally conceded that in the field of very large aircraft, the seaplane is the more efficient transport. Base requirements (runway length and strength) for the large landplane become prohibitive to finance. In addition, the large, heavy landing gear for landplanes displaces a considerable payload. Recent hull developments indicate that the seaplane should be able to compare favorably with the landplane in aerodynamic efficiency. Of particular interest to the Navy is the fact that transport versions of military seaplane airframes make much better transports than military landplane airframes since seaplane hulls are generally more roomy. Most patrol seaplanes can, for the Navy's purposes, perform the duties of transport seaplanes when required, very little modification being necessary. In the field of large overseas seaplane transports, the Martin Mars has been very successful.

Due to many factors, some mentioned herein, it is expected that the landplane will predominate in numbers in both the patrol and transport fields of the present and immediate future. However, there will continue to be a requirement for seaplanes as well as landplanes, the one complementing the other, and both necessary in various phases of naval air operations. As aircraft become larger and larger, it is conceivable that one day the landplane size will reach such proportions that adequate bases will not be available, and runway requirements will constitute a great construction problem. Beyond certain maximum practical sizes, further increases will have to be confined to the seaplane field. In this day of revolutionary changes in aircraft and power plant design, it is difficult to estimate what tomorrow may bring in the field of supersonic aircraft, perhaps powered with atomic energy.

AVIATION MEDICINE *

Introduction

In spite of the tremendous difference between the structure and design of the early plane that flew at Kitty Hawk and the one that approached the speed of sound over the American Mojave Desert, there has been a distinct lack of change in the structure and design of the men who flew those two airplanes. It is true, of course, that although physical standards have been set up for military and for commercial pilots, and although we are able to select those who are physically fit to fly and to prevent the obviously unfit from flying, we are in no way able to alter the human organism to increase its ability to withstand the conditions encountered at high speeds and altitudes.

Since its inception in 1875, when Paul Bert first attempted the use of oxygen as an aid to the balloonists of his day, aviation medicine has tried to aid the aviator in his efforts to solve the problems incidental to aviation. Bert supplied oxygen in flasks so that the balloonist might reach higher altitudes.

Aviation medicine today has developed many other aids to increase the tolerance of human beings to the additional physiological stresses imposed by increasing speeds and altitudes.

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* Condensed from *Air Affairs.*

Use of Oxygen

After the birth of aviation, a long interval was required for the appreciation of the necessity for the use of oxygen in altitude flights. It is true that for a number of years after the Wright brothers made their first flight, airplanes could not climb high enough to require the use of additional oxygen. It was only after changes in structure and design had reached the point to permit high-altitude flights that it became obvious that human limitations would prevent further development unless some means were found to provide a safe and adequate supply of oxygen to the pilot.

The ability of a human being to utilize oxygen in his lungs depends primarily upon the pressure of the oxygen in the small lung alveoli, or air cells. As we ascend, although the percentage of the oxygen in the air remains relatively constant, the entire atmospheric pressure decreases. If we ascend high enough we will eventually reach a point at which the pressure of oxygen within the lungs is not sufficient to supply the ordinary physiological requirements. This condition (known as anoxia), if sufficiently severe, will result in unconsciousness and death.

Under ordinary circumstances, a person is not able to maintain his normal efficiency for any prolonged period at an altitude above 10,000 feet. As a matter of fact, if he is flying at night, his night vision will be impaired even below that level. There are, of course, many stories of old-time aviators who went far above 10,000 feet without the use of oxygen, but it was perhaps only for a short period and their efficiency while so exposed is open to debate.

MARTIN MAULER—DIVE-TORPEDO-BOMBER
As a dive-bomber the Mauler is built to withstand vertical dive speeds of more than 500 miles per hour. It is designed for operation off aircraft carriers of the *Midway* class.

An oxygen supply system has been developed that will automatically supply increasing amounts of oxygen as altitude is increased until finally, at approximately 30,000 feet, the user is receiving pure and undiluted gaseous oxygen. Until recently, such a system has been highly satisfactory and has met all ordinary military and civilian demands. Airplane design, however, now requires pilots to reach greater heights than is possible with the conventional diluter-demand oxygen systems, and, as a result, there have been developed systems through which the oxygen provided to the pilot is under higher pressure than the ambient air and by means of which he is enabled to reach somewhat higher altitudes without the occurrence of anoxia.

Even this, however, is not sufficient to enable the pilot to reach the maximum altitude limits of the modern airplane. Therefore, it has been necessary to pressurize the cockpit, or cabin, of the airplane itself so that these greater heights may be reached. It should be theoretically possible to pressurize the cabin of an airplane to such a degree as to enable it to be flown at any given altitude. However, this is not practical. Instead, the cabin of the airplane is pressurized for a given altitude, and above that altitude oxygen is used, thus enabling the pilot to reach greater heights than would be possible with either oxygen or pressurization alone.

In spite of all that has been accomplished, the fact remains that man's physiological requirement for oxygen is today a definite limiting factor on his attempts to fly at higher altitudes and will, in all probability, remain so in the future. There are limits to the degree of pressurization to oxygen systems. It remains to be seen what are the limits of pressurization of the aircraft itself.

Aeroembolism

Aeroembolism is a condition that is similar to the "bends" experienced by divers and is probably due to the collection of bubbles of nitrogen in the body tissues. It has been seen frequently in men who have gone to high altitudes both in aircraft and in the experimental low-pressure chambers. It has been associated with relatively prolonged exposure to relatively low pressure and while the occurrence has varied in individuals, both in character of manifestation and in degree, previously it was not expected to appear below 20,000 feet.

It was surprising, therefore, to find that a large percentage of the observers who were healthy young men did exhibit symptoms of that condition when subjected to repeated exposures to the lower pressures of relatively low altitudes. This immediately presented the problem as to whether the aeroembolism was caused by the rapidity with which the decompression occurred or because of the frequency of exposure. The question is of considerable importance because of the fact that the rate of decompression in the chamber — the rate of climb, so to speak — was less than the potential rate of climb of most of our modern and projected aircraft. The military importance of this question is obvious since increasing rate of climb will be of no advantage if such rapid ascent incapacitates the pilot or if repeated flights involving a high rate of ascent do likewise. Investigation is now underway in an effort to answer these questions and if it is found that the problem is a real one, steps will be taken to protect the pilot against the occurrence of disabling bends under such circumstances.

Acceleration

Acceleration is commonly thought of as the rate of change in the velocity of an object moving along a straight path, but there are two other types of acceleration. One has to do with the rate of change of direction of movement of an object and the other pertains to the rate of rotation of an object about its own axis. The two former types affect the body principally by the induction of stress while the latter type's most obvious effect is the production of vertigo, or dizziness.

The pilot of an airplane experiences the force of acceleration every time he changes his direction of flight and every time he changes his speed. In flying straight and level at a constant airspeed, he is subjected only to the normal gravitational forces, but the instant he changes his speed or the instant he enters a turn, he then has increasing forces applied to him which, in the case of the turn, are proportional to the square of the velocity and inversely proportional to the radius of the turn (i.e., the sharper the turn, the greater the force of acceleration).

JET-ASSISTED TAKE-OFF
Bi-motored Martin Mariner (PBM) in a jet-assisted take-off (JATO) that enables this heavy plane to shoot rapidly up off the water.

The effects of linear acceleration have so far proved to be of more importance from a functional point of view than from the standpoint of interference with normal physiological processes. If the forces are sufficiently great, the pilot feels as if he were pushed back into his seat and finds it difficult to use his hands and feet in managing the controls of the airplane. Because of this, the initial accelerations provided by a launching catapult have to be kept low so that full control of the airplane may be maintained by the pilot. The effects of radial acceleration developed by a change in direction are quite different. If the force applied is sufficient in amount or is applied for a sufficient time, the pilot may experience the classical picture of blackout, the onset of which is indicated by a dimming of vision, followed by a constriction of the visual fields, and finally resulting in complete loss of vision and loss of consciousness. This unhappy train of events is caused by interference with the normal supply of blood to the brain. Human ability to resist these forces varies, not only among individuals, but also in individuals themselves at different times.

The importance of acceleration as a factor in the limitation of pilot performance should be obvious. During World War II, in order to utilize the maximum performance of the airplane, it was necessary to increase the pilot's tolerance to acceleration. This was accomplished by the development of a fitted suit which was equipped with an inflatable bladder capable of applying pressure to selected body areas and thereby preventing the pooling of blood in the abdominal area as well as diminishing the loss of blood supply to the head. The efficiency of the suit in increasing tolerance to acceleration cannot be questioned, but the actual increase in tolerance was not so great as was desired. Curiously enough, the wearing of the suit also appeared to be of unexpected help in the prevention of physical fatigue, a result for which there is still no completely adequate explanation. In spite of its advantage, however, the suit will not provide the protection which pilots of the future may be expected to require. In order to secure maximum performance of the plane, the body of the pilot must be aided to increase his tolerance to a higher degree than is possible today.

Escape from Aircraft

The classical methods of parachuting from a damaged airplane are not practical in high-speed military planes. It does not appear possible for the unaided pilot to leave his plane rapidly enough to enable him to escape injury from contact with the tail surfaces of the airplane which project high above the fuselage.

This problem was solved by the development of a mechanical means to throw the pilot from the airplane with sufficient velocity to enable him to clear all of the structural members of the tail surfaces. The mechanism is known as the ejection seat and it depends upon the firing of a powder charge to provide the power for its operation. When fired, it hurls the pilot, still attached to his seat and parachute, out of the plane at an initial velocity which is dependent upon the type and size of the powder charge. Needless to say, the force of acceleration to which the pilot is initially subjected is of considerable magnitude. The effect of this amount of force would undoubtedly have a harmful effect on the human body were it not for the extremely short time during which the force is applied. The interference with the normal blood circulation is of such short duration as to be negligible, but care has to be taken in the proper positioning of the pilot prior to ejection to prevent the occurrence of back injuries as a result of the sudden application of force.

It must immediately occur to the reader that it might be much more simple to escape through the bottom of the airplane since the tail surfaces ordinarily do not project below the fuselage to any considerable extent. However, the limiting factor here is that the human body cannot tolerate gravitational force applied in a foot-to-head direction to the same degree that it can tolerate a force applied in a head-to-foot direction. The former type is referred to as a negative force while the latter is termed a positive force. The actual limits of tolerance to the negative forces have not as yet been exactly determined, but when they have been, it will probably be entirely feasible to eject the pilot downward, if such means of escape is considered desirable.

Limiting factors in the use of the ejection seat as a means of abandoning damaged aircraft are the effect of wind blast and of deceleration. For some time it has been considered that a wind blast of 500 miles an hour is about the upper limit of safe human tolerance without further protection other than that afforded by the usual flight clothing and helmet. Indeed, the ejection seat is designed to afford some degree of protection for the face during the period of initial exposure to the wind blast of speeds less than 500 miles an hour. The question of the nature and amount of protection required to prevent damage to the skin of the face is still to be determined.

Since it is true that the harmful effects of deceleration can be similar to those caused by acceleration, it is clear that the position in which a man is decelerated is of extreme importance. If a pilot is ejected from his plane while traveling at high speed and if he assumes a position which allows the forces of deceleration to act in a foot-to-head direction, there is the distinct possibility that the symptoms of blackout may occur and so incapacitate the pilot that he may be unable to operate his parachute and oxygen equipment in making his descent unless they are controlled by automatic means. Moreover, if the force of deceleration is applied in a head-to-foot direction, the harmful results will simulate those produced by negative accelerations which the human body is even less able to tolerate.

It becomes apparent that if the body is to withstand the effects of deceleration, the force must be applied transversely. In order to assure that this will happen, it is necessary to retain the pilot in an upright, or sitting, position while the force is applied and until his velocity has been reduced below dangerous limits. The probabilities are that this can be accomplished by detaching the pilot's entire cockpit from the airplane, creating as it were a capsule in which the pilot remains seated and protected from the effects of wind blast until the velocity of the capsule has sufficiently decreased to allow him to leave its protection and then to permit him to continue his descent via parachute without harm from the forces of the wind blast or deceleration.

Conclusion.

The problems of aviation medicine which have been so briefly discussed here presented themselves as the result of improvement in aircraft design with the consequent increase in the speeds of flight and the increase in altitudes to which the planes can climb. These problems have all occurred while airplane speeds remained below the speed of sound, an area in which projects in experimental physiology have not been too difficult to perform. A different picture is presented by airplanes flown at speeds in excess of that of sound. Whatever the difficulties encountered and however numerous they may be it is reasonable to assume that they will eventually be adequately solved. Man's utmost limitations have not yet been reached.

SAFETY EQUIPMENT

Types of Safety Equipment

Safety equipment developed especially for the protection and saving of lives of aviators and aircrewmen may be roughly divided into the following groups: flight equipment, parachute equipment, flotation equipment, and survival and rescue equipment.

Flight Equipment

The following items are supplied as flight equipment: flight clothing, oxygen equipment, anti-G equipment, restraint devices.

Flight clothing varies to fit the need of the operating locale and conditions. Garments range from lightweight clothes to warm pile-lined coveralls complete with parka and boots for extreme temperatures. Intermediate equipment is provided with electrically heating features. Articles included under flight clothing consist of the following general classes: boots, trousers, jacket, shirts, scarves, coveralls, gloves, parkas, helmets, and goggles.

As oxygen is required for extended flights at altitudes in excess of 10,000 feet, there must of necessity be a dependable supply of breathing oxygen to meet all situations that might arise. Oxygen installations in naval aircraft are of the fixed, walk-around, and bail-out type. In VF aircraft wherein the pilot is in one position, the fixed installation is used unless a bail-out at high altitudes is necessary. If such is the case, a bail-out unit is utilized until the parachute descends to a level at which there is sufficient O_2 to sustain life. In patrol-type aircraft, wherein crew members move from place to place, they may utilize the plug-in facilities and walk-around units.

Anti-G (G is the measurement unit for gravitational force) equipment is provided in certain high-speed aircraft of the attack type to minimize the accelerative force tending to cause blackout in high-speed pull-outs and turns. Use of anti-G equipment enables pilots to operate effectively under conditions normally intolerable if such equipment is not provided. Anti-G suits are of the coverall and skeletal type and are sized to meet individual size requirements.

FIGHTING SQUADRON
Pilots of a Navy fighting squadron gathered in the ready room before dawn, prior to a scheduled attack. Dark goggles are worn by those who are to take off in darkness.

Safety belts and shoulder harnesses are furnished and attached to the seats or airframe of all aircraft. The purpose of the safety belt and harness is to insure that the pilot and crew are properly positioned regardless of the altitude of the aircraft. In the event of a crash landing, the shoulder harness is of inestimable value in that it prevents pilot or passenger from being thrown forward against the instrument panel with resultant injury or death.

Parachute Equipment

The study of parachutes is a field in itself, but a review of existing parachute equipment may be presented briefly.

Prior to 1948, the standard parachute supplied for use by aviation personnel consisted of a 24-foot (diameter) nylon or silk canopy with either the quick-fit seat, quick-fit chest, or quick-fit back type harness. Due to the increased speeds of aircraft with the resultant decelerations to be withstood at bail-out, and because of the safer and lower rate of descent offered by it, the Bureau of Aeronautics standardized on a 28-foot nylon canopy. As this canopy is effective only up to 300 knots, research is now in progress on the development of special parachutes and ejection methods for subsonic and supersonic speeds and the results obtained are rapidly integrated into the over-all parachute program.

Flotation Equipment

The following flotation equipment items are provided for use by naval aviation personnel.

MK 2	Pneumatic life vest
MK 2, 4 and 7	Life raft (multiplace)
AR-4	Lifeboat
PK-2	Pararaft
PK-1	Packet raft
AR-10	Rescue assembly

MK 2 Life Vest. The life vest is worn by all personnel flying over water. The vest is inflated orally and by carbon dioxide and is equipped with the following signaling aids: a light, dye markers, pyrotechnic items, and a whistle.

MK 2, MK 4, and MK 7 Life Rafts. Standard multiplace life rafts (MK 2 — 2-man, MK 4 — 4-man, and MK 7 — 7-man) are provided to accommodate the crews of naval aircraft. These rafts are carried within the aircraft as part of its equipment and are supplied with survival and signaling aids and protective and comfort items. These rafts may be dropped to personnel in distress, and recorded instances of survivors staying afloat in them in excess of four weeks have been noted.

AR-4 Lifeboat. The pneumatic lifeboat represents the latest in droppable equipment for use at sea. The AR-4 incorporates some radical sailing and comfort features, and provision has been made for the use of an outboard motor for propulsion.

PK-2 Pararaft. The PK-2 pararaft is worn by pilots of carrier-type aircraft. This unit is attached to the parachute assembly and contains a one-man raft and advanced items of signaling and sustenance equipment.

PR-1 Packet Raft. The PR-1 raft is provided for aircrewmen in cases where space precludes use of larger kits. The packet is worn over the shoulder and contains a one-man raft of the PK-2 type without equipment.

AR-10 Rescue Assembly. The AR-10 pneumatic life raft (powered) is designed for dropping from an aircraft bomb bay to personnel afloat or adrift at sea.

Equipped with survival and signaling aids, fuel, and propelling equipment (sail and power), the AR-10 adequately accommodates 10 men.

Survival and Rescue Items

With the exception of the two types of exposure suits, survival and rescue items cover a wide range of equipment and uses from "Anchors, Sea" to "Whistles, Police." Of these items the more important are briefly described below:

Dye Marker. Sea dye marker is provided both as a component item of the life vest and as life-raft equipment. It readily marks a survivor's position in the water, making it visible to searching aircraft.

Distress Signals, MK 13 Mod. 0. The MK 13 Day and Nite Signal incorporates a red flare for night use and an orange smoke signal for day use. This signal is provided as a component item on life vests and in all rafts and droppable kit-assemblies.

Signaling Mirrors. Signaling mirrors incorporating a sighting device for easy and accurate reflecting of the sun's rays are provided in all life rafts to attract the attention of searching aircraft to survivors in the water.

Corner Reflectors. The corner reflector (Emily) consists of a parabolic metallic screen easily assembled and rigged in a life raft for attracting the attention of aircraft searching for survivors with radar equipment.

MK 2 Solar Still. This distilling unit is provided in all life rafts on a basis of one still per man. The still utilizes the energy of the sun to distill sea water and render it potable in quantities sufficient to sustain life under tropical conditions.

ADS-1 Signaling Kit. This kit is dropped from sighting aircraft to survivors in the water. It provides additional signaling aids that assist other rescue aircraft or vessels in effecting a pick-up.

ADR-1 Sustenance Kit. This kit is dropped to survivors in the water. Its contents supplement the sustenance aids provided in the life raft until such time as a pick-up may be made.

Exposure Suits. Exposure suits are supplied in two styles, quick donning and constant wear. The quick-donning suit is supplied to crews of multi-engine aircraft operating in northern latitudes and is put on immediately preceding a ditching at sea. The constant-wear suit is supplied for the same purpose but it is put on before take-off and worn throughout the flight by pilots and crew of CV-type aircraft. The suit is a garment of water-impermeable fabric that enables the airman to ditch in the water, break out, and inflate his raft and set up housekeeping with a minimum of exposure to the numbing effects of the water.

Electronic Items. The AN/CRC-7 VHF transreceiver is provided in PK-2 pararafts to enable carrier personnel at sea to communicate with search aircraft on 140.58 megacycles. This unit has an effective range from sea to air (10,000) feet of 40 miles.

The AN/CRT-3 is the latest version of the wartime "Gibson Girl." It is provided for use by patrol plane crews in "SOSing" on 500 and 8280 kc when down at sea.

Other items of interest and effectiveness are:

- Signaling paulins
- Knives
- Ponchoes
- Oars
- Inflator pumps
- Sea anchors
- Water storage bags
- Emergency compass
- Flashlights
- Whistles
- Life-raft rations
- Shock repellents
- Bailing sponges
- Hammock beds
- First-aid kits

CHAPTER 19

UNDERSEA WARFARE

BACKGROUND OF SUBMARINING

Early History

Man's first submarine went down somewhere under the tides of antiquity. Submerged in legend is the diving bell of Alexander the Great, supposedly constructed so that he might visit the lair of a whale. A primitive submarine built of leather seems to have been constructed in the 12th century. But historians generally concede the first true submersible was built and launched in England by the Dutchman, Cornelis Drebbel. A rowboat covered with leather and propelled by 12 oarsmen, this remarkable craft made a "trial run" under the Thames in the year 1620. By this it may be seen that the traditions of submarining are anchored deep in the past, although the applications of that endeavor to warfare are comparatively modern.

The first submarine to enter combat was invented in 1776 by an American, David Bushnell. Revolutionary in every sense of the word, Bushnell's *Turtle* made a submerged attack on a British warship in New York Harbor. Operated by a hand-worked propeller, her tanks flooded by a valve and emptied by a hand pump, the *Turtle* encountered overpowering difficulties and her maiden foray ended in failure when her boring screw broke off in the copper bottom of the enemy ship. After failing in the Delaware the following year, Bushnell's submarine was subject to ridicule as were his unique "powder keg" torpedoes. The chagrined Yankee genius retired to become a forgotten backwoods schoolmaster. Not until after the war was it known that his submersible worried the British into moving their blockading warships from New York Harbor to the outer bay.

Robert Fulton's *Nautilus*, operating successfully in European waters two decades later, shocked the English with its destructive possibilities. A diving boat that could navigate at a depth of 25 feet spelled future trouble for surface navies — trouble that materialized in the sinking of the Federal warship *Housatonic* by one of the ingenious Confederate *Davids* of the Civil War. A hand-propelled, iron boiler which could travel with deck awash and drive a "spar torpedo" into the hull of an enemy vessel, this submarine, the invention of H. L. Hunley, presented a serious threat to the Federal blockade. The *Davids* had their counterpart in the Federal *Alligator*, sunk in a storm off Hampton Roads before she could go into action.

These were the forebears of the modern submarine.

The Coming of the Moderns

Three hampering factors limited the operations of the early undersea boat. Low vision restricted its navigation on the surface, and the vessel was blind when submerged. Underwater weapons, sufficiently destructive, had to be towed into contact with the target, or punched at the target, or attached to the target — close-range devices that inevitably endangered the submarine. And, steam power proving impracticable for propulsion when submerged, motive power was of necessity supplied by man power, willing but soon expended.

The first problem was solved by the periscope, designed by the inventor, Marie Davy, in 1854. The submarine now had eyes.

The weapon problem extended over a longer period. Bushnell's *Turtle* had attempted to attach a form of time-bomb to the hull of HMS *Eagle,* lying at anchor in New York Harbor. Fulton employed a similar underwater bomb (which he called a torpedo) with telling effect. During the Crimean War (1854-1856), a Russian submarine launched in the Baltic featured a pair of waterproof gloves which protruded like hands from the submersible's hull and permitted the operator to juggle a bomb or cable for attachment to the hull or rudder of an enemy vessel. The spar torpedo of the Civil War was simply a bomb affixed to a long spar on the submarine boat's prow — a hazardous weapon for jousting, and the one that destroyed the Confederate *David* even as it sank the intended target. Not until Robert Whitehead's "automotive" torpedo was constructed in Fiume, Austria, in 1864 was the problem of the submarine weapon successfully solved. Whitehead's torpedo was propelled by a small reciprocating engine. Several decades were to pass before the development of the steam torpedo driven at high speeds by compressed air; and directional accuracy came in 1885 when Lieutenant Howell of the United States Navy invented the vertical rudder controlled by a gyroscope. The mobile torpedo, however, first went into combat as the weapon of the surface torpedo-boat.

Then came the internal-combustion engine and, simultaneously, electric motors run by storage batteries. Submarine propulsion was solved. By 1890, John P. Holland and Simon Lake, American inventors, were hard at work over their drawing boards. Nordenfelt in Sweden, and Zede and Romazzotti in France were building submarines. In 1900 the USS *Holland* was launched. Six more United States submarines were commissioned in 1902. In 1905 the Germany Navy obtained its first U-boat.

Naval warfare had entered its third dimension.

THE SUBMARINE IN WORLD WAR I

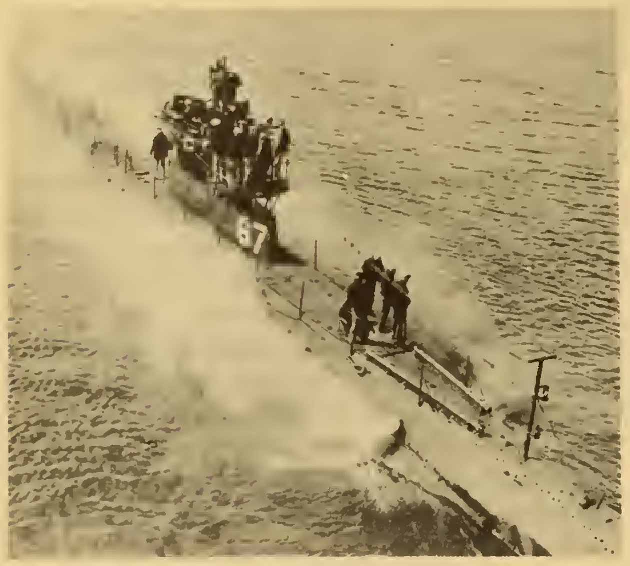
The First Undersea War

The navy of nearly every major power was experimenting with or operating submarines in 1914 when World War I exploded in Europe. But only the Germans had fathomed the potentialities of undersea warfare and were prepared to exploit fully the unique capacities of the submersible.

Submarine warfare was considered decidedly unorthodox. But orthodoxy has no inherent military value, as the first nonconformist cannon at Crecy has aptly demonstrated. Commodore David Porter remarked how Navy heads, rejecting the submarine with aversion, "preferred the more chivalric method of sinking vessels with 24-pounders, or mowing down their crews with grape and canister." In 1914, British Admiral Sir Arthur Wilson advised that submarines should be outlawed and their crews hanged for piracy. Mars acknowledges no altruistic obligation, however, and war inevitably follows the laws of practicability. Employing the submarine for warfare, the Germans were availing themselves of a superior weapon, differing from armored car, tank, aircraft, or battleship only in its operating element and singular capabilities.

First of these, and not the least important, was the submarine's ability to operate undetected (and unsupported) in enemy-controlled waters. Concealment, shielding the submersible, also armed it with that most invaluable weapon — surprise. Capitalizing on the surprise attack — a tactic long cherished by land and naval forces — the undersea boat could strike and retire with relative impunity. This was an advantage of which surface and land forces were generally deprived.

Another advantage enjoyed by the submarine was its seakeeping ability. Of all oceangoing vessels, the submarine remains the most seaworthy, for it may run submerged beneath tempest or typhoon, and thus "out-ride" the wildest storm. When all hands were struggling to keep a surface ship on course, the early U-boat could, and did, deliver a devastating attack. To this extent, its operations were free of weather restrictions. Blizzard, rainstorm, or fog might blur its vision, but these conditions were compensated by the



OLD O-TYPE SUBMARINE
This is one of the old-type submarines that is equipped with many modern scientific improvements and instruments for training purposes.

fact that they also screened exposed periscope or conning tower and provided the submarine with additional cover.

Again, the submarine, small, compact, and manned by a small company of operators, could trade blows with the largest battleship or ambush the most heavily armed transport, and it could strike these vessels in their most vulnerable spot — their unprotected bottoms. The merchantman, armed or unarmed, was particularly defenseless in the face of submarine attack. The Kaiser's naval chiefs had long recognized Britain's dependence on merchant shipping, although the U-boat fleet had not been designed primarily for a war on commerce.

In July 1914, the German Navy boasted 28 U-boats, with 17 more in the process of construction. The French Navy led the field with 77 submarines, the Royal Navy maintained 55, and the United States Navy owned 38. But the German U-boat fleet, although small, was superior to the others. Developed in great secrecy, the German diesel engine gave the U-boat a cruising range many miles beyond that of the British E-class submarine or the American gasoline-engined model.

On 8 August 1914, two days after the outbreak of hostilities, the German submarine U-15 attacked the British battleship *Monarch*. The attack, which failed, is recorded as the first in which a mobile submarine torpedo was fired at an enemy warship. On 22 September 1914, the torpedoes of U-9 struck home, and three British heavy cruisers were sunk in the English Channel by this one submarine in a single day. The Royal Navy had met a foe who, in six weeks of warfare, was threatening to gain mastery of the sea.

The English countered with mines, Q-boat "decoys," and a barrage of moral indignation. This last proved particularly effective, for it succeeded in branding the U-boat as the "serpent of the sea," and eventually may have helped to turn American opinion against the German war effort when the U-boat went all-out as a commerce raider. First depredation on commerce, the stoppage and scuttling of the steamer *Glitra* by U-17 (in October 1914) presaged the wholesale onslaught on merchantmen soon to follow. At first deplored, then enthusiastically advocated by Grand Admiral von Tirpitz, the U-boat blockade of England was launched in January 1915. On 4 February, the Kaiser proclaimed the waters around the British Isles a war zone, and neutral shipping was advised to keep out. Two weeks later, U-boat captains were ordered to sink all enemy ships encountered but to spare neutrals, hospital ships, and relief vessels. Then the Norwegian tanker *Belridge*, en route to Holland from America, was sunk. On 7 May, the Cunard liner *Lusitania* was torpedoed by a U-boat off the coast of Ireland — a disaster that cost the lives of 1,198 passengers, including 128 Americans. Sequel to a U-boat attack on the American ship *Gulflight*, the *Lusitania* sinking strained American-German relations to the breaking point. That was reached in 1917 when England was on the verge of starvation, and the U-boat blockade had all but won the war.

Antisubmarine War—World War I

On 1 January 1917, the Germans swept all restraint aside and defied American reprisal with an announcement of unrestricted submarine warfare. At least 103 U-boats were available for action, and the British were known to be in desperate straits. During the five previous months they had been losing an average of 37 ships a month — tonnage far beyond their capacity for replacement. Now, in February 1917, the U-boats sank 86 British vessels. In March the total went to 103, with an appalling loss of over 300,000 tons. Almost 500,000 British tons (900,000 Allied) were sunk in April, the month before the United States entered the war. The situation was without precedent. A relatively small striking arm had impoverished a major power and was threatening to starve a great nation into submission. England's industry was slowing to a stop for lack of imported raw materials; her food supply was almost gone. The U-boat's effectiveness was acknowledged by Admiral Jellicoe, First Sea Lord of the Admiralty, when he declared, "They will win unless we can stop these losses, and stop them soon."

British antisubmarine measures had proved of little avail. Antisubmarine mines, nets, and other underwater traps may have accounted for a number of U-boats reported as *sperlos versenkt* —"sunk without trace." Some 47 Q-boats were in action by the autumn of 1916. Disguised as tramp freighters, these decoy-ships carried powerful guns behind their raffish camouflage. Inviting submarine attack, they were "wolves in sheep's clothing," ready to meet the assault with a savage counterstrike. But only 13 U-boats were sunk by these decoy-ships during the entire war, for the German submarine commanders were soon wary of the strategem, and did not rise to the bait with any consistency.

To combat the undersea menace, British destroyers were detailed to the U-boat hunt. Depth charges made their appearance about the time the British hydrophone was produced. Both of these devices went into action against the submarine in the summer of 1916, scoring initial success on the night of 6 July when a British patrol craft contacted the minelayer UC-7 and destroyed the submersible by depth-bombing her. Aircraft were also pressed into antisubmarine service. Early methods and devices were crude, but the concentrated U-boat hunt and the arming of merchantmen put a strain on the German submariner's morale and to some extent forced the *unterseebooten* to forego surface running and operate with caution. But it was America's entry into the war that broke the U-boat vise on British shipping and wrecked the unrestricted submarine warfare campaign designed to force England's surrender by the summer of 1917. The Kaiser's U-boats, powerful though they were, could not stop the massive flow of American shipping, supported by the overwhelming resources of the United States and escorted by the aggressive, unwearied United States Navy.

The U-boats tried. In May 1918, U-151, under Kapitan von Nostitz, crossed the Atlantic to attack American coastal shipping. U-151 sank a number of vessels by torpedo fire, and mines laid by another raider, the U-155, sank the elderly, armored cruiser *San Diego*, off Fire Island. That autumn the battleship *Minnesota* was damaged by a submarine-laid mine off the Delaware coast. Other U-boats attacked shipping in American waters. These forays, however, only stiffened American resistance which was already defeating the German submarine effort.

American countermeasures began in May 1917 with the dispatch of six destroyers to Queenstown, Ireland, to join the British antisubmarine patrols. Zigzagging, blackout, and steaming at high speed were defense measures which had been employed by the British. The Americans were eager to attack the U-boat, and our destroyers were well equipped with depth charges to be launched from stern racks or thrown from "Y" guns. In home waters, a "mosquito fleet" of fast, agile subchasers was organized to patrol off the eastern seaboard. But the chief American contribution to the antisubmarine war was the convoy system, instituted largely at the insistence of Admiral William S. Sims. Obviously there was safety in numbers if a flotilla of merchantmen was protected by a sufficient number of escorting warships. After the first convoy (from Gibraltar to London) arrived without mishap in May 1917, the system was adopted. A few days later a convoy from Hampton Roads reached the British Isles without loss. The U-boat's defeat was assured.

Evasive routing, a wireless warning system, and intelligence devoted to trailing U-boat movements all aided in countering the German undersea offensive. By November 1917, the Allied shipping loss had been reduced to 300,000 tons — about one-third of the previous April total. Throughout that winter and the following spring, the antisubmarine war continued. United States naval aircraft, with 27 bases in Europe, inaugurated an active U-boat hunt, American planes were credited with the destruction of only one submarine, but they reported 39 attacks and many contacts, and their reconnaissance patrols made U-boat operation in shallow coastal waters extremely hazardous.

So far, the U-boat had been countered mainly by defensive measures—the arming of merchantmen, zigzagging, the convoy system, evasive routing, shipping blackouts. Offensive measures — the antisubmarine patrol, the development of the hydrophone, the depth charge, the aerial bomb — had driven off the U-boats, rather than sunk them. Only 55 or 60 had been destroyed during the first three years of the conflict, and when America entered the war, German U-boat replacements were averaging three a week.

The weapon that proved particularly effective was an American product — the Mark H mine. When the crisis was at its height, there had been many crackpot ideas for combating the U-boat. These included the employment of trained seals to detect submarines, and a plan for diverting the Gulf Stream in order to freeze up the U-boat harbors. Some Americans wanted to know why mines could not be planted off the mouths of German harbors to blast the U-boats as they sortied. One such American was Secretary of the Navy, Josephus Daniels. In reply to Daniels' query, the British pointed out that they had planted some 30,000 mines in Heligoland Bight, and the Germans had swept up these fields almost as soon as they were planted.

A DANGEROUS TASK
Stray mines, a grim reminder of war years, are dealt with by Navy Ordnance Disposal Teams.

The requisite was a mine that could not be thus easily swept. The standard item of the period was a contact mine, globular in shape, with wart-like horns projecting an inch or two from its surface. Already in production was a novel American mine equipped with long antennas which extended in the water like tentacles. These "long-armed" electric mines were detonated when metal came in contact with one of the antennas. The British remained skeptical. Could this Mark H mine be manufactured in sufficient quantity to cover a large area? The Navy guaranteed production of 1,000 a day. An area extending from the Orkney Islands to Norwegian waters was marked for mining. This 230-mile field was planted, in the main, by American minelayers operating throughout the winter and spring of 1918. By the end of the war, approximately 70,000 antenna mines had been laid in the North Sea, 80 percent of the work being done by the American force.

In width varying from 15 to 35 miles, this North Sea minefield was only partially planted when the barrage began to take a U-boat toll. In July a badly damaged U-boat staggered home, reporting the new peril. Then, in rapid succession, three U-boats were lost. August merchant shipping sinkings totaled 280,000 tons; September's 187,000 — the Allies were winning the antisubmarine war. On one late-summer day the Germans lost three more U-boats to the North Sea mine barrage. By October some 17 U-boats were sunk or damaged by the great mine barrier and at least 40 were missing, their fate undetermined. At Wilhelmshaven the German submariners mutinied. The mutiny spread to the fleet at Kiel. The Germans had lost the undersea war and with it all hope of defeating the Allied coalition.

In November the German High Command sued for an armistice, and World War I was over.

UNEASY PEACE (1919-1939)

Naval Limitations

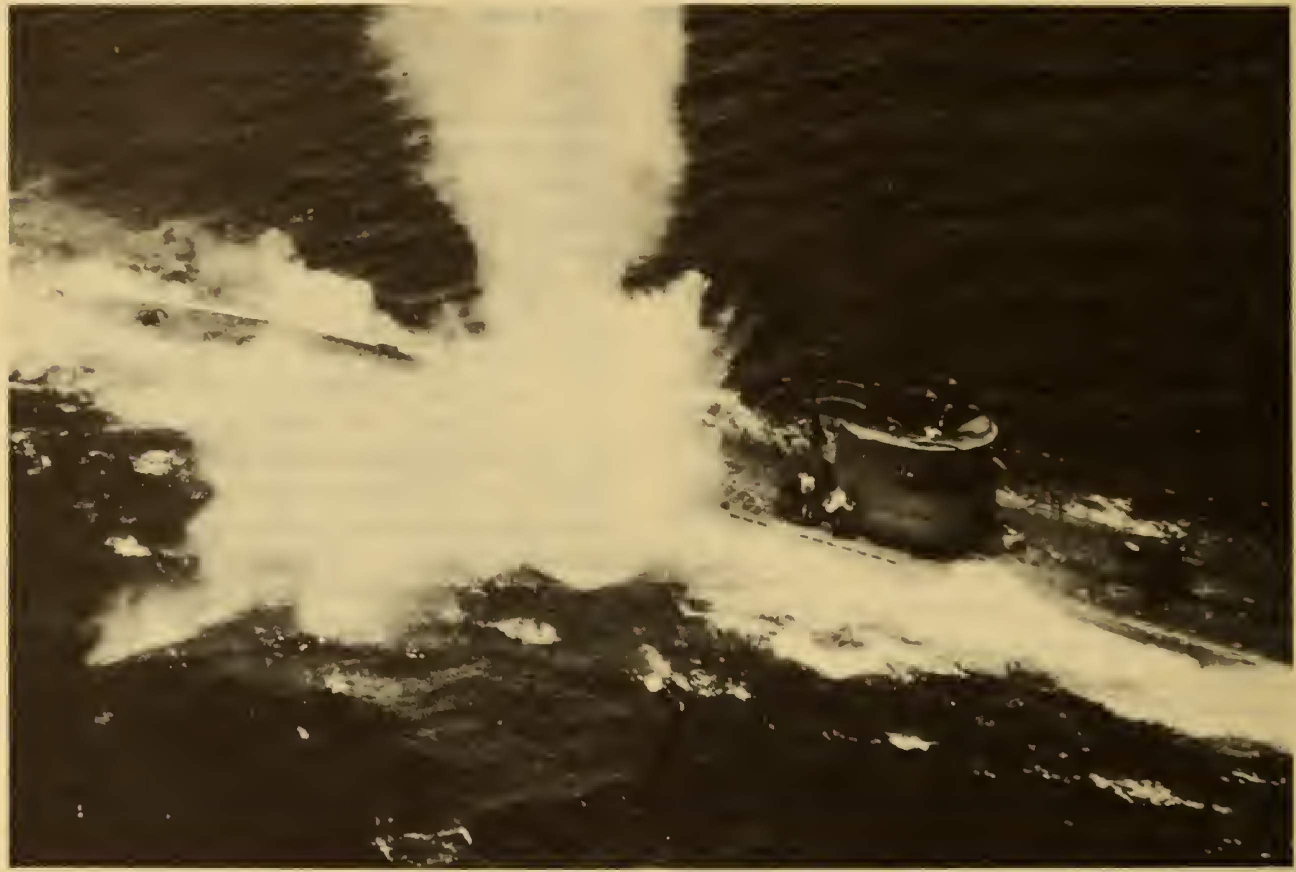
At the time of the German surrender in 1918, few observers suspected that World War I, with its immense toll of human life and colossal material destruction, was but a dress rehearsal for a second global conflict—a two-ocean war in which the submarine would play an even greater part than in World War I.

The U-boat had downed over 11,000,000 tons of Allied and neutral shipping. This stupendous depredation forced Churchill to acknowledge that the submarine menace was, in his opinion, "the gravest peril that we faced in all the ups and downs of that war." Yet the U-boat had been overcome by the depth charge, the hydrophone, the convoy system, and the mine barrage. Its defeat encouraged wishful thinking on the part of naval strategists who assumed that submarining had suffered a knockout blow. By these conservatives, the near victory over the U-boat was regarded as something of a fluke. They contended that the imperative "control of the seas" could never again be threatened by the submarine. The submersible (they said) was essentially a commerce raider. By itself it was incapable of forcing a naval decision. Battle fleets, alone, could dominate the seas, and naval air would doubtless develop a powerful arm to support fleet operations. Never again would the submarine gain the initiative as a "secret weapon," and its operations would be further restricted by new and better detection devices, more powerful undersea mines and bombs, and long-range air patrols. So the orthodox, thinking in terms of a war that was over, failed to foresee the possibilities of the next.

Meantime, a diplomatic offensive was launched against the submarine. Despite the assertions in official quarters that the submarine's hey-day was over, the British Government, fearing a renewal of undersea warfare in some unpredictable future, attempted to outlaw the submersible. At the Washington Conference for the Limitation of Armaments in 1922, Great Britain advocated the abolition of submarines. The United States temporized with a proposal to limit submarine building, for the Americans wished to retain submarines for scouting and reconnaissance work, yet hoped to "humanize" submarine warfare by restricting submarine attacks to those made on naval vessels. France, Italy, and Japan opposed all limitations in this respect. As finally ratified, the treaty restricted neither submarine tonnage nor submarine warfare.

The London Naval Conference of 1930 proved almost as futile. Maintaining that the submarine was the strongest defense of a weak naval power, the French and Italian representatives withdrew from the conference. However, the United States, Great Britain, and Japan did agree to a limit of 52,700 submarine tons for each. The three powers subscribed to a provision (Article 22 of the London Naval Treaty) prohibiting the sinking of merchantmen by submarines before the merchant crews were safely away. But in 1935 Japan's leaders voted to abrogate the tonnage restrictions. A new treaty, framed in 1936, removed all tonnage restrictions on naval construction, thereby permitting any nation to build as many submarines as its purse could afford. The provision outlawing unrestricted submarine warfare remained in effect. But a treaty is, after all, no more than a contract between nations, and an old axiom has it that a contract is no better than the intentions of those who sign it. At length, the Government of Nazi Germany agreed to prohibit unrestricted submarine warfare.

Hitler had been rebuilding the German Navy since 1934, first in flagrant violation of the Versailles Treaty, and then behind the legalistic front of a bilateral agreement with Great Britain. Nazi intentions were masked by threatening gestures in the direction of Russia and an Axis pact presumably aimed at Communism. In the meantime the German Navy grew, and with it a modern U-boat fleet capable of an Atlantic offensive. Small to the eye of the observer, this U-boat force could be swiftly expanded, and behind it lay a generation of experience and technical knowledge. Von Tirpitz once had complained that the Germans did not "understand" the sea. But, perhaps better than their rivals, German naval heads understood the waters under the surface and appreciated the advantages of submarine warfare.



A U-BOAT THAT NEVER RETURNED
This was a sure kill as naval aircraft moved in on a German marauder.

The Nazi U-boat

The modern Nazi U-boat was as far ahead of the Kaiser's model as that diesel-driven submarine was ahead of its British rival. Hitler's builders favored a small submarine (740 tons) with a cruising radius of about 7,000 miles. Six torpedo tubes gave this undersea boat superior fire power. Electronic gear, improved fire-control equipment and listening instruments provided it with the latest appurtenances of science. Early experimenters with periscope photography, the Germans had developed a periscope camera unmatched by any competitor's. And in the spring of 1939 the Nazis were producing a magnetic influence exploder which could detonate a torpedo when it came within the magnetic field of a steel ship. Calculated to eliminate the necessity of a direct hit, this device promised to revolutionize torpedo warfare.

Organized by Admiral Doenitz, the Nazi U-boat force was imbued with Prussian tradition and well trained. German submarine tactics were highly aggressive, featuring daytime attacks made at periscope depth and night attacks on the surface where the submarine could take advantage of high surface-speeds. British and American attack doctrines were at that time conforming with the belief that aircraft were the submarine's deadliest foe and the submersible must, above all, avoid detection and counterattack from the air. Hence, while the Germans were concentrating on attack methods, British and American submarine training placed heavy emphasis on evasion. This was, perhaps, in acknowledgment of the new and powerful antisubmarine devices developed in England and America.

In the past decade the British had produced the asdic—an electronic device capable of bouncing a "beam" off a submerged metal hull, thus indicating a submarine's location with much exactitude. American scientists improved on this with sonar (a name deriving from the term "sound navigation and ranging"). With asdic or sonar probing on the trail, the submarine could be detected when submerged; and these electronic devices threatened to deprive the submersible of that concealment which was its shield and cloak. Improved depth charges, 1,000-pound aircraft bombs, and the establishment of hunter-killer destroyer groups and antisubmarine patrol forces boded ill for the detected submarine. Warships were heavily armored below the waterline and designed with protective bulges and compartments to frustrate torpedo explosions. The British placed much confidence in these antisubmarine measures. Six months before the outbreak of World War II, Churchill wrote of the submarine as "obsolescent."

When the Germans invaded Poland, the Nazi U-boat force numbered 76 submarines. On 3 September 1939, Great Britain and France declared war on Nazi Germany. Less than nine hours after the declaration, the British liner *Athenia* was torpedoed by a U-boat off the west coast of Ireland. The liner carried 1,103 passengers, including 311 Americans. Unrestricted submarine warfare was once more loosed upon the Atlantic, and the U-boat offensive was again underway. On 17 September, the large aircraft carrier *Courageous* was sunk by a German submarine, and on 14 October, U-47, under Kapitan-Leutnant Gunther Prien, penetrated the harbor defenses of Scapa Flow and sank the battleship *Royal Oak.*

World War II was going full blast, and the submarine was indeed far from obsolete.

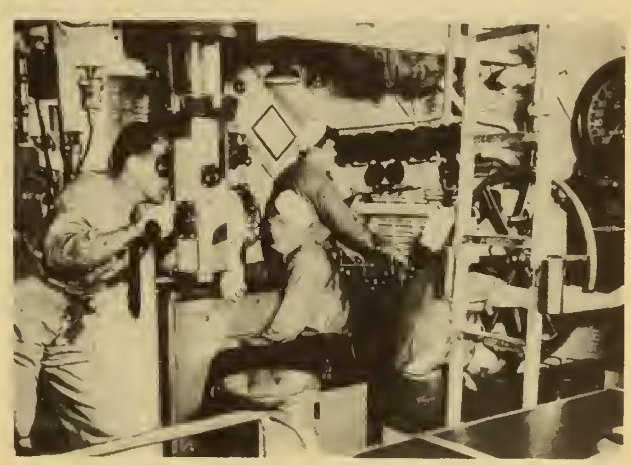
WORLD WAR II

Opening Undersea Phase

Although the Nazis plunged into World War II with a larger force of superior submarines than were in the Kaiser's Navy, they were unable to reap such a harvest as they garnered in the first months of World War I. The strikes at the Royal Navy were spectacular and destructive, but the naval tonnage sunk was about half the total downed in the first six months of the previous war. The convoy system and the new antisubmarine devices immediately employed by the Allies held shipping losses in this period to some 200,000 tons monthly. These losses were severe but far from critical. In December 1939, Churchill spoke with optimism of the situation, implying that the U-boat situation was well in hand.

Aircraft and asdic were partly responsible for this early antisubmarine success. Another factor was failure of the German magnetic-influence exploder to meet expectations. In his Scapa Flow exploit, Prien was troubled by torpedo failures, and other U-boat captains reported similar difficulty. The Germans presently discarded the magnetic feature and returned to the more reliable contact exploder.

Meantime, Allied submarines were striking back. In September 1939, the Royal Navy had available for war duty a force of 60 submarines. The majority of these had been built in 1918-1919. About a dozen modern boats were under construction. At the war's outbreak, British submarines were called home from the Orient to patrol in the Channel and the North Sea. The large French submarine force was, by agreement, to cover the Mediterranean area.



ATTACK OBJECTIVE IS SIGHTED
Battle stations are manned in a submarine control room.

British submarine successes were meager at the start of the war. But when Hitler's legions invaded Norway on 9 April 1940, the British submarine *Truant* sank a German cruiser off the Norwegian coast, and some 90,000 tons of Nazi invasion shipping were torpedoed and sunk before the end of the month. The Polish submarine *Orzel* climaxed a remarkable exploit during this campaign. Early in the war she had been captured by the Germans and held prisoner in the Baltic. Outwitting the guards, the Polish crew made off with the submarine and, running without compass or charts, escaped from the Baltic and took the *Orzel* to England. On patrol off Norway with her allies, she sank the large Nazi transport *Rio de Janeiro.*

Conquest of Norway gave the Germans a strong position on the northern flank of the British Isles. Then Holland, Belgium, and France collapsed, and Atlantic and Channel ports were available as U-boat bases. The impoundment of the French Navy forced the British to take over the Mediterranean defense. British submarines maintained Mediterranean patrols for the next three years while the conflict raged in North Africa.

History Repeats

With strategic French, Belgian, and Dutch ports at their disposal, the U-boats stepped up their Atlantic offensive. In June 1940, the British, Allied, and neutral shipping loss was 397,000 tons. For the remainder of that year, the monthly average topped 350,000 tons. Neutral American shipyards had begun to work overtime, and merchantmen flying the Panamanian flag were carrying British cargoes. But losses were far beyond the British capacity to replace, and by the end of 1940, Churchill's optimism had turned to somber doubt.

Royal Air Force patrols were guarding the approaches to the British Isles with considerable success, and British submarines patrolling the Channel and Bay of Biscay were troubling the U-boats. But these defense measures only drove the German submarines out into the Atlantic where British-controlled shipping was harder to defend. The history of 1917 was repeating itself in September 1940 when an appeal from England resulted in the sending of 50 over-age American destroyers to that embattled isle in exchange for long-term leases on sites for naval bases in the Western Hemisphere. At the outbreak of World War II, the United States Government and the Latin-American republics had established a "safety belt" on the American side of the Atlantic. U-boats were warned to hunt no shipping in this 300-mile-wide belt. The chain of leased base-sites assured strong protection for the American seaboard in the event of war between the United States and Nazi Germany.

PREPARING TO DIVE
Closing the hatch as the submarine prepares to submerge.

Lend-lease went into effect in March 1941, and the United States became the "Arsenal of Democracy." With the passage of the Lend-Lease Act; the status of the United States shifted from neutral to nonbelligerent. Secretary of the Navy Knox declared, "We cannot allow our goods to be sunk in the Atlantic," and American naval patrols were extended to Greenland and Iceland to protect shipping which was carrying tanks, guns, foodstuffs, and munitions to England.

To counter the air defenses of the waters around the British Isles and Allied antisubmarine measures in the Atlantic, the U-boat Command devised a new tactic—wolf-packing. This was a system of group control which permitted the submarines wide dispersion for search and strong concentration for attack. It also placed the group under the direction of an ace skipper whose talents would otherwise be confined to the operation of a single submarine. Roaming the open Atlantic, the scouts of the pack would contact a convoy. The pack would then assemble at some distant point on the convoy's track and lie in ambush. Night attacks were favored, and a mass assault on the convoy train was certain to scatter the escorts and allow some of the U-boats to penetrate the screen and strike at the milling transports.

In April 1941, the U-boats sank nearly 600,000 tons of British-controlled shipping. The sinkings decreased in May, June, and July as the Anglo-American antisubmarine patrols tightened the defense. But the defenses were by no means watertight. The Germans were maintaining an average of 36 submarines at sea in the summer of 1941, and the number of U-boats in the Atlantic was more than doubled late in the autumn.

On 4 September 1941, a U-boat attacked USS *Greer*, an old "four-piper" patrolling off Iceland. Two torpedoes were fired. Both missed. The *Greer* dropped a pattern of depth charges, and the U-boat escaped. This was the Navy's first shooting brush with the U-boat in World War II. The previous May, the *Robin Moor*, an American merchantman, had been sunk by a U-boat in the South Atlantic. But our naval vessels were ordered to fire on Axis submarines only in self-defense. They were to track them and report their movements, but open hostilities were to be avoided.

Three days after the *Greer* skirmish, German aircraft sank the American freighter *Steel Seafarer* in the Red Sea. On 11 September, President Roosevelt ordered Navy patrollers to "shoot on sight" any German or Italian submarine or surface raider which molested merchant shipping of any flag in the American defense area. The Nazi reply was an attack on the destroyer *Kearny* in October, followed by one on the naval tanker *Salinas*. Both American ships were damaged by U-boat torpedoes but managed to make port. Then, 24 hours after the *Salinas* attack, the destroyer *Reuben James* was struck. The *Reuben James* broke in two and sank. Angered by the heavy casualties, Congress voted to arm merchant vessels and let them carry lend-lease cargoes to British ports. Once more the Germans had to face the problem of dealing with United States convoys.

Thus, history was repeating itself—England slowly sinking, her maritime lifelines slashed by a U-boat offensive, and the United States coming to the rescue. But the present is never an exact replica of the past, and no two wars are ever alike. Open hostilities a certainty, the Nazis played for time, hoping to gain bases in the Azores and on the West African coast, and perhaps bring Franco Spain in as an active partner before striking at America. The Japanese raid on Pearl Harbor jumped the gun. In compliance with their Axis pact, Nazi Germany and Fascist Italy declared war on the United States on 11 December 1941. The United States was thereby forced to fight a two-ocean war.

In the Atlantic, World War II had already developed as a struggle between the U-boat and antisubmarine forces—following the pattern of World War I. In the Pacific, American submarines were to play a leading role. Their mission was an all-out attack on Japanese merchant and naval shipping, paralleling that of the U-boat in the Atlantic. Thus in both oceans, undersea warfare was the dominant theme, and upon submarine and antisubmarine offensives the fate of the opposing powers depended.

SUBMARINE LOOKOUT
From the conning tower, the lookout scans the seas for enemy ships.

The Battle of the Atlantic

During the first ten months of 1942 the Battle of the Atlantic was in the balance. In this period the U-boats dealt their hardest blows, and Anglo-American losses totaled some 800 ships—better than 4,000,000 tons. At the same time, the U-boat force paid dearly for this success. In January 1942, 93 U-boats were operating in the Atlantic, and 40 more were available for duty in the Mediterranean and in the Barents Sea. This number was greatly reduced that spring and summer—an average of 43 U-boats operating continuously at sea in June. Altogether the Germans lost 78 submarines during this period. U-boat replacements were forthcoming, but the Germans were unable to replace the experienced captains and veteran crews. Already such ace skippers as Schepke and Prien were among the missing, and Nazi submarines were going to sea with men who lacked adequate training.

Nevertheless, the situation remained critical for the Allies until well into 1943. Upon entering the war, the United States was presented with a triple problem in the Atlantic—maintenance of transport lines to the British Isles and the Soviet Union, protection of American coastal shipping, and escorting South Atlantic shipping bound around the Cape of Good Hope to the Red Sea. The United States Atlantic Fleet was engaged in convoy duty with its heaviest forces covering the area between Iceland and the United Kingdom. In these waters, beyond range of land-based air patrols, the crucial Battle of the Atlantic was fought out by hunter-killer groups and U-boats. In spite of stalwart Armed Guard contingents and heavy naval escort, losses on the Murmansk Run to Russia were particularly painful and resulted in the establishment of transport lines via the Persian Gulf and Iran. On the American-Atlantic coast a system of sea frontiers was organized to defend coastwise traffic. During World War I, some 79 vessels were sunk by U-boats off the eastern seaboard. In spite of the newly organized sea-frontier defenses, World War II losses in this area were much higher. Army and Navy forces, including subchaser patrols, Coast Guard units, Eagle boats, aircraft and blimps, strove valiantly to guard the coastal waters between Canada and Florida, but the situation was not eased until convoy escorts were provided for coastwise shipping in the late spring of 1942. By the end of 1942, most of the U-boats were withdrawn from the western Atlantic.

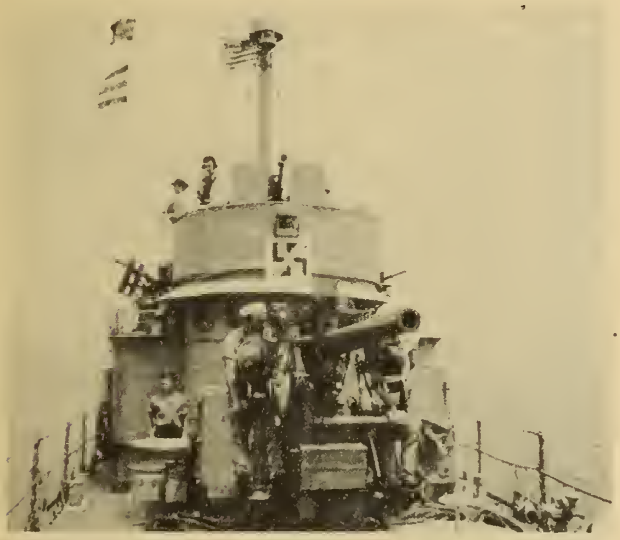
DIVINE SERVICE UNDER THE SEA
These submariners were fortunate in having a chaplain aboard as a passenger.

Operating in wolf-packs in the North Atlantic, the U-boats were not easily downed. The modern U-boat was a formidable opponent. When depth-charged, it did not break up as did its riveted forerunner in World War I. Welded construction provided the pressure hull with elasticity, and a direct hit or an explosion close aboard was required to destroy the hull. Capable of diving to 600-foot depth, the German submersible could usually elude echo-ranging sonar detection. Supply or "cow" U-boats were employed to provision the wolf-pack submarines—a maneuver that lengthened their stay at sea.

The destroyer escort and the escort carrier emerged as the wolf-pack's deadly enemy. The small DE, much cheaper and easier to build than a destroyer, could do the convoy work of a DD when it came to dropping depth charges. The escort carrier answered the problem of providing air cover for convoys in mid-Atlantic. That these new submarine-hunters could do a job is evidenced by the fact that the Germans lost 150 U-boats in the first six months of 1943. To provide his submarine with aircraft defense, Doenitz ordered the installation of antiaircraft guns on the U-boats. But surface actions are never the submersible's calling, and the submarine that attempted to shoot it out with a dive bomber was courting suicide.

It has been said, with due respect to the active combatants, that the Battle of the Atlantic was "fought out in the laboratories." In December 1943, Doenitz issued a top secret order which contained the admonition, "It is essential to victory that we make good our scientific disparity and thereby restore to the U-boat its fighting qualities." In consequence of this appeal, German scientists who had been drafted to shoulder rifles were recalled from military service to help create Germany's Naval Scientific Directional Staff. This body had its counterpart in the American Tenth Fleet (the coordinating agency for antisubmarine warfare) when Admiral King organized a Scientific Council composed of civilian scientists. Like the Axis scientific staff, the American council devoted its energies to the development of new submarine and antisubmarine weapons and devices.

The Germans produced an acoustic torpedo which "homed" itself on target, attracted by propeller sounds. Another torpedo looped in wide curves, thereby increasing the possibility of a hit when fired into a convoy. The American answer to the acoustic torpedo was a "noisemaker" to be towed from a vessel's stern and divert the torpedo.



TEN-MINUTE SUB KILLER
The PC565 loosed its depth charges on a submarine four minutes after first contact was made. Within six minutes the sub was on its way to the bottom of the Atlantic.

To frustrate sonar, the Germans attempted to coat the U-boats with rubber—a resort that proved futile. They also employed *pillenwerfer*—chemical pellets which, strewn in the water, served to deflect the sonar beam. Meantime, the Allies introduced infra-red light rays for the detection of submarine silhouettes at night, and sonobuoys which contained hydrophones and radio transmitters and would broadcast a warning when a submarine came within range.

Many of the submarine-detection devices invented during World War II remain secret. Probably the most important of the innovations was radar, described by Admiral Doenitz as "next to the atomic bomb, the most decisive weapon of the war." The U-boat was unable to escape radar's all-seeing eye, and Doenitz mourned to the head of the Scientific Directional Staff that the enemy had "rendered the U-boat war ineffective."

Frantically working to defeat this menace, the German scientists came up with their most important contribution to the undersea war. This was the snorkel extension stack—a tube which expelled the diesel exhaust and sucked in fresh air. Equipped with snorkel, the U-boat could operate on diesel propulsion while submerged at periscope depth. It did not have to surface to charge batteries, and its diesel engines, able to run under the surface, gave the submarine a much higher submerged speed than its motor-driven rivals. Moreover, the U-boats literally maintained radio silence, thereby frustrating detection by radio direction-finders. The snorkel device went far to eliminate surface operation, and the U-boat thus regained its "invisible cloak."

But snorkel came too late to save the Nazis. In order to install this device, it was necessary to withdraw many of the U-boats from the North Atlantic. During the interim, the U-boat Command hoped to fight a delaying action by operating submarines in widely dispersed areas where antisubmarine forces were relatively weak. From late 1943 until May 1944, the U-boats were scattered in the Atlantic—strategy that weakened the U-boat effort and failed to deter losses. Between July 1943 and May 1944 inclusive, 199 U-boats were destroyed by the Allies.

Meantime, Allied bombers from England were hammering at the German submarine pens and demolishing German industrial plants. By the summer of 1944, Doenitz was scraping the bottom of the barrel for men and materiel. Operating from bases in Norway and the Baltic, a few U-boats equipped with snorkel were harrying the shipping off the British Isles in the autumn of 1944, but the Normandy landings had already spelled Hitler's doom, and the Battle of the Atlantic was flickering out. It ended on VE-day, 8 May 1945. A total of 781 German submarines had been sunk, approximately 30,000 German submariners dying with them. Having come within an ace of victory, the U-boat force was all but wiped out.

Atlantic Conclusion

Devastating as was the Anglo-American antisubmarine effort, it was unable to prevent the U-boat from wreaking havoc on Allied shipping. Before it was driven from the Atlantic, the German submarine force succeeded in sinking more than 2,500 Allied ships, with a total displacement of some 14,500,000 tons—about 62 percent of all Allied shipping lost. Two battleships, two aircraft carriers, and a considerable number of destroyers and escort vessels had succumbed to German submarine torpedoes. In 1942 and early 1943 the U-boats had raided the western Atlantic, exacting a heavy toll of American shipping, littering the beaches from Maine to the Florida Keys with wreckage, establishing a partial blockade of the Virginia Capes. One U-boat had landed a party of saboteurs on Long Island, and perhaps others succeeded in similar missions. While American coastal cities feared air raids, it was the German submarine that brought the war to American shores.

Far from proving obsolete, the submarine, equipped with snorkel, went into action as a true submersible. It seemed to be the consensus of the Allies that this undersea boat could out-distance and probably shake off any escorts that might attack it. For this submarine, German designers claimed a cruising range of 22,000 miles and submerged speed of 24 knots. Such submarines, along with "homing" torpedoes, will furnish a powerful undersea arm for navies of the future. They can be built in secret, and they will undoubtedly be employed by the smaller naval powers. Small, compact, relatively inexpensive as warships go, submarines represent great force in a minor-size package. "Don't make any mistake about big submarines being obligatory," wrote Admiral Lord Fisher in 1912. "They will be Destroyers with all the advantages of the present Destroyers and—as well—the power of submergence during daylight attacks. Battle tactics will be revolutionized . . ." True in World War I and World War II, Fisher's comment may well apply to tomorrow.

DEADLY WEAPON ON A CALM SEA
A peaceful sight, but ready to explode into violent action when the enemy is sighted.

Admiral Doenitz complained that the Battle of the Atlantic was lost before it began. Had Hitler paid more attention to the German Navy, he would have had 1,000 U-boats available at the beginning of the war. Fortunately for the Allies, Der Fuhrer's intuition was focused on land warfare. The Japanese, too, overlooked the potentialities in submarine warfare. Hence, they were unable to cope with the submarine forces of the United States in the Pacific.

THE PACIFIC WAR

American and Japanese Submarines

On 7 December 1941, the United States Navy had in commission 111 submarines. Under the operational control of Commander Submarines, Atlantic, were 60 submarines. In the Pacific were the remaining 51. Of these, 22 were attached to the Pacific Fleet based at Pearl Harbor, and 29 were operating with the Asiatic Fleet based at Manila.

Not all of these submarines were available for immediate duty. A number were undergoing refit or overhaul. The majority in the Atlantic were venerable R-boats built for coastal defense, and S-boats constructed in the decade following World War I. During that war, the United States Submarine Force had been in its formative stage, and the American submarines (K-boats) sent into European waters had seen little action. But in the 1930's after experimenting with such large submarines as *Argonaut*, *Narwhal*, and *Nautilus* (V-boats), American submarine designers concentrated on a fleet-type submarine capable of long-range cruising in the Pacific. Culminating development of this type was the *Gato*-class submarine, going into commission on the eve of the Pacific war's outbreak. Equipped with eight torpedo tubes, four diesel engines, modern fire-control instruments, sonic gear and air conditioning, this submarine could cover some 10,000 miles at normal cruising speeds for an average patrol of 75 days. Construction yards were tooled up to produce this model, and with the installation of minor alterations, it remained the standard American submarine to go into action during the war.

A JAP GOES TO THE BOTTOM
Scene from the USS *Wahoo* (SS516) on a patrol in which she sank eight Japanese ships.

In the autumn of 1941 the submarines in the Pacific were alerted and readied. Training was intensified. As a strike in the Philippines was expected, the Submarine Force, Asiatic Fleet, conducted practice patrols that amounted to the real thing. The Pearl Harbor submarines, under Admiral Thomas Withers, engaged in strenuous "readiness-for-war" trials. But the force was trained to fight an orthodox undersea war—a war in which submarines would serve as scouts, perform reconnaissance missions, lay mines, and support the operations of the surface forces. American submarine captains expected to abide by the conventional rules. All that was changed by the pressure of events.

The Japanese began the war with 63 ocean-going submarines in commission. These included I-boats—a long-range submarine, averaging 2,000 tons, with 22-knot surface speed and fire power approximating the American fleet-type—and the smaller RO-boats. Their design based on German prototypes acquired after World War I, they were capable submarines, and a number were equipped to carry planes. During the war, the Japanese built the large I-400 class with 5,700-ton surface displacement, 8 bow torpedo tubes and carrying-apparatus for 4 planes. Before and during the war, the Japanese built many midget submarines—of doubtful value.

Four or five I-boats accompanied Yamamoto's carrier force that attacked Pearl Harbor. Several of these carried midget subs. Launched in the waters off Oahu, one midget managed to penetrate Pearl Harbor early in the morning before the attack. The little craft was sunk off Ford Island before it could do any damage. Another midget lost its way and was beached by its despairing captain. While these midget efforts were ineffective, they demonstrated the submarine's ability to defeat detection and "get in" where surface craft might fear to tread.

More dangerous than the midgets were the mothering I-boats lurking off the mouth of Pearl Harbor;

their mission was to attack the American battleship fleet if it attempted to steam out during the raid. The colossal destruction dealt by the Japanese bombers held the American warships in the harbor at bay. When the raid was over, the Pacific Fleet was immobilized.

This was stunning news for Admiral Hart's Asiatic Fleet compelled, single handed, to hold the Philippines against invasion. The 29 Asiatic Fleet submarines were promptly deployed to defend the islands as Hart's few cruisers and destroyers could not hope to cope with the Japanese Second Fleet. An equally staggering task faced the Pearl Harbor submarines which were expected to cover the vast Central Pacific from the Mandate Islands far north to Japan. And a few hours after the Pearl Harbor strike, the United States submarines were ordered to attack all enemy shipping, merchant as well as naval. For it was realized the Japanese invaders would move by ocean transport, and only cargo vessels could carry home the raw materials plundered from conquered territories. In no sense could such shipping be considered legitimate commerce, and our submarines were ordered to sink everything that floated under the Rising Sun.

Pacific Strategy and Tactics

The Pacific war was from start to finish a sea war. Sea power set the pattern and dictated the moves. Air and land forces played important roles, but sea forces played the lead. Over-all submarine strategy called for a war of attrition against Japanese merchant shipping. As the attrition war developed, target priorities were altered and submarines launched an all-out offensive against the Imperial Navy, simultaneously conducting a blockade against Japan.

For two years American submarines bore a heavy brunt of the fighting—holding the defense line in the Southwest Pacific and leading the Navy's offensive in the Central Pacific. Japanese shipping was the crux of the war situation—transports to support and maintain the offensive, merchant fleets to exploit the conquered territories, support Japan's home economy, and supply the Tojo-Yamamoto war machine.

CLEAN—BUT COLD—SWEEP
The broom indicates a successful combat patrol as this submarine comes in after an Arctic cruise.

At the start of the war, Japan had available approximately 6,000,000 tons of ocean-going steel ships, some 4,000,000 tons being assigned to separate Army and Navy pools for transport and supply service. The remaining tonnage was necessary for the maintenance of Japan's home economy. The Japanese war-planners counted on a whirlwind offensive that would bring the Philippines, the Netherlands East Indies, and Indonesia into the iron embrace of the Greater East Asia Co-Prosperity Sphere. After capture of these territories, outlying bases in the Mandates and New Guinea area would stand as an outer defense ring while the conquered territory was fortified and exploited. Hirohito's generals and admirals expected a Hitler victory in Europe and a showdown naval battle with the United States Fleet in Empire waters. Yamamoto expected to win this last battle, or force a stalemate. But everything depended on the Japanese transport system—the carrying of troops and planes to the front, and cargoes of oil, coking coal, nickel, foodstuffs, and other necessary imports home to Japan.

The Japanese strategists made two fatal miscalculations. First, they underestimated the American recoil—the quick recovery of naval strength and repairment of the fleet damaged at Pearl Harbor. Second, they underestimated the powers of the United States Submarine Force. Ordered to concentrate on heavy fleet units at Pearl Harbor, the Japanese raiders overlooked the Pearl Harbor Submarine Base and the five submarines berthed there on 7 December. In their strike at Manila on 10 December, the Japanese airmen completely demolished the Cavite Navy Yard. They did not bomb the submarines in Manila Bay, and only one submarine, the *Sealion* (the first American submarine loss of the war), was destroyed at Cavite. These deliberate oversights apparently accorded with Japanese theorizing on submarine warfare.

In mournful post-war recollection, Admiral Nomura observed that the Japanese leaders "very greatly underestimated the strength of your submarines, they did not expect they would be so effective. . . ."

These expectations the Japanese leaders were soon to regret. As early as January 1942, Pacific Fleet submarines were sinking Jap ships off the coast of Honshu and the toe of Kyushu. American strategy called for an immediate blockade of Japan, and this blockade was conducted by submarines from Pearl Harbor with steadily increasing effectiveness throughout the war. And as the Japanese offensive rolled over the Philippines, Asiatic Fleet submarines were beginning that war of attrition that eventually reduced the Japanese merchant marine to a mere skeleton. On December 15 the *Swordfish*, off Hainan Island, sank the first enemy merchantman to go down in the Pacific conflict, torpedoed by an American submarine. Twelve days later, the *Gudgeon* sank a Japanese I-boat some 700 miles off Midway—the first warship ever downed by a United States submarine.

But the submarines in the Southwest Pacific, left without air support, deprived of their home base after the fall of Manila, and fighting a lone battle after the destruction of Admiral Hart's surface fleet, were unable to delay the onrushing Japanese. Driven from pillar to post as the Allies retreated from the islands of the Malay Barrier, the force finally found a haven in Fremantle, Australia. From there it assumed the task of carrying on the attrition war in the lost Netherlands Indies, the Philippines, and the South China Sea. In the Central Pacific the Pearl Harbor submarines concentrated late in May 1942 for the defense of Midway. From Australia to Midway to the Aleutians, the Navy was determined to hold the line, and submarine patrols were links in the chain. But a defective torpedo hampered our submarine defenses for the first two years of the war. Yet 580,390 tons of Jap shipping had been sent to the bottom by submarines before the end of 1942.

The Japanese Submarine Effort

The Japanese Submarine Force began the war with a torpedo much superior to that of the United States. Its explosive charge was almost twice that of the American, and it left a less noticeable wake than the American steam torpedo. Given this advantage, the Japanese submarines struck hard blows in the war's first year. They severely damaged the aircraft carrier *Saratoga* as she rushed to the relief of Wake Island. During the Battle of Midway, the I-168 sank the crippled aircraft carrier *Yorktown*. On 15 September, Japanese submarines intercepted a carrier force heading for the Solomons. The *North Carolina* was damaged by a torpedo, the destroyer *O'Brien* was fatally hit, and the submarine I-19 torpedoed and sank the aircraft carrier *Wasp*.

The Japanese submariners were unable to maintain this pace. During the Gilberts campaign in November 1943, a Japanese submarine torpedoed and sank the escort carrier *Liscome Bay*. They did not score another major sinking until July 1945, when the I-58, patrolling north of Leyte, ambushed and sank the heavy cruiser *Indianapolis*.

This notable decline in the Japanese submarine effort was caused by a number of influential factors. Japanese submarine strategy was, in general, inferior to American. The Imperial Navy's submarines were frequently employed by the Army as transports. Fifteen were used to evacuate the hard-pressed garrison in the Aleutians. Others were used to carry munitions and planes to outlying posts and, late in the war, to haul aviation gasoline from the East Indies to Japan. American submarines performed such special missions, but not to the neglect of their primary mission —the attrition war on enemy shipping. In scouting and reconnaissance, Japanese submarines were competent—it was a submarine that located the *Prince of Wales* and *Repulse* and brought doom to these British warships at the war's very outset. But there was no central operational command, and the submarine effort lacked coordination. Further, as the war progressed, Japanese submarines lagged "in the laboratory." Japan's scientists were unable to match Allied developments in the field of radar, sonar, and fire control. This scientific factor had its reflection in the antisubmarine war. As the Allied antisubmarine forces became organized, experienced, and more effective, Japanese submarines went down at a faster rate. The Japanese antisubmarine effort, on the other hand, was indifferent and poorly organized. In both aspects of undersea warfare—submarine and antisubmarine—the Japanese proved inept.

Antisubmarine War in the Pacific

The Japanese were woefully unprepared when it came to antisubmarine defenses. Located several hundred miles off the coast of the Japanese home islands, a chain of sampans and nondescript patrol vessels served to guard the approaches to Nippon. Mines watched the entrance to Tokyo Bay, and minefields were planted off Hokkaido, in the East China Sea, and in the passages entering the Sea of Japan. Invasion shipping moved under guard of naval escorts, but many cargomen on the lanes going down to the South China Sea and the East Indies traveled unescorted. At the start of the war these merchantmen were unarmed and for many months thereafter Japanese ships were only sketchily armed, some going to sea with helpless dummy guns.

MOUSETRAP
The mousetrap shown here is one form of ahead-thrown weapons, so called because they are affixed to the bow of vessels.

The Japanese had a good echo-ranging device at the war's outbreak, and Imperial Navy destroyers were fast, hard hitting and well trained. The Japanese depth bomb was the equivalent of that employed by the Allies. A large variety of patrol craft supplemented the destroyer force, and the powerful *Chidori* "pinger," corresponding to the American DE, was a dangerous submarine hunter. But the Japanese convoy system was jerry-built and remained disorganized until late in the war. Land-based aircraft flew antisubmarine patrols in the Solomons-Bismarck-New Guinea area, and to a lesser extent in the Philippines-Netherlands East Indies theater and the home islands. Coordination between aircraft and surface antisubmarine forces was indifferent. Late—too late—an attempt was made to provide air escort for convoys. By 1944 the Japanese were far behind in the electronic field of detection. A few radar-equipped search planes were flying antisubmarine patrols at the end of that year, but by that time the shortage of planes, trained pilots, and aviation gasoline was grounding the Japanese air effort.

One of the chief reasons for Japan's mediocre antisubmarine campaign was over-optimism. Submarine killings were reported on the flimsiest of evidence. Frequently the attacked submarine eluded destruction by "going deep," and the Japanese depth bombs, set too shallow, exploded overhead. American submarines often eluded the enemy by hiding under a density layer, that is, a stratum of sea water which, varying in density from upper levels, deflected a probing sonar beam. A lack of persistence characterized the Japanese antisubmarine attack. American submariners were thankful for the cocksureness of their opponent and did nothing to dispel his exaggerated confidence. Altogether, the Japanese reported 468 American submarines destroyed during the war. Actually, American submarine losses totaled 52. Of these, only 48 were lost in combat operations, and not more than 41 were destroyed by enemy action.

In comparison, the Japanese lost between 125 and

SCOURGE OF JAPANESE SUBMARINES
The USS *England*, one of the destroyer escorts that helped to rid the seas of enemy submarines.

130 submarines during the war. About 110 of these were destroyed by enemy action. Twenty-six were downed by American submarines—over twice the number destroyed by aircraft—which established the submarine as a deadly hunter of its own kind. But American antisubmarine forces were far more aggressive and successful than the Japanese. In the Pacific they employed the devices which drove the U-boat out of the Atlantic—among these being the hedgehog, which threw an entire pattern of depth charges with each salvo. The hedgehog depth charge was much smaller than the standard "ash can" or "tear drop," but the salvo, which covered a wide area, had an effect similar to shotgun fire. Operating in May 1944, the destroyer escort, USS *England*, in teamwork with the USS *George*, USS *Raby*, and USS *Spangler*, put on a performance that bid fair to hedgehog the Japanese Submarine Force out of existence. On a rampage in the Solomons, the *England* destroyed six Japanese submarines in eleven days—a feat that broke two world records. Fortunately for the Americans, the Imperial Navy had no such antisubmarine teams in the field.

Torpedoing the Japanese Merchant Marine

The Battle of Midway stopped the Japanese in the Central Pacific, their Aleutian diversion was stalled the following month, and the Solomons counterdrive stymied them in the Southwest Pacific. By the end of 1942, the Japanese offensive was over, and the tide had turned. Japan was left with a conquered area wide in oceanic extent but small in land acreage. The American undersea campaign to cut the transportation lines of Japan's western Pacific empire was intensified.

Southwest Pacific submarines based in Australia patrolled from Fremantle and Darwin to the Gulf of Siam, harried Jap shipping in the Netherlands Indies and Philippines, and slashed the main traffic lane down the South China Sea to Singapore. Central Pacific (SubPac) submarines roamed in the Gilberts, Marshalls, Carolines, and Palaus, patrolled the Nansei

Shoto chain, invaded the East China and Yellow Sea, and blockaded the home empire. The night surface attack was a favorite, and the "end around" tactic was developed with notable success, the submarine contacting a convoy, and then running up ahead to attack it as it came down the track.

Early in 1943 Rear Admiral Lockwood replaced Admiral English (who had been killed in a plane crash) as commander of the Pacific Submarine Force. Lockwood's forceful and inspiring leadership sparked the submarine drive in the Central Pacific until the end of the war. Improved torpedoes and abandonment of the faulty magnetic exploder sent the sinking score kiting. In the autumn of 1942, the old Panama S-boats, which had made a valiant cross-Pacific run to hold the line in the Solomons-Bismarck area, were withdrawn. New construction submarines, replacing the old, carried the attrition war forward at four-engine speed. In 1943 the Pacific and Southwest Pacific submarines sank 284 Japanese ships for a total of 1,341,968 tons.

The Japanese merchant marine was already severely damaged when the war stormed into 1944. During this year, pacing the United States Navy's drive through the Mandates to the Philippines, American submarines all but decimated Japanese merchant shipping. Some 492 ships were sent to the bottom by submarine torpedoes—a staggering total of 2,387,780 tons. By the end of the year the Japanese home empire was facing a rice famine, Japan's war industries were scraping barrel-bottom for vital ores and chemicals, and the Imperial Navy and Air Force were out of oil. Closing in on Japan, our submarines had invaded the Japan Sea and were swarming in Empire waters. The Rising Sun was setting.

Sinkings in 1945, January to August, were superficial. The enemy merchant marine was reduced to a point where there were few vessels at sea to sink. By the spring of 1945, Japan's economy was ruined, the Greater East Asia Co-Prosperity Sphere had dried up, and the Japanese war effort was at low ebb.

Many daring harbor penetrations and attacks occurred in the submarine war on Japanese shipping. Outstanding were the raids conducted by the *Tang*, *Wahoo*, *Barb*, *Flasher*, *Seahorse*, *Tautog*, *Rasher*, *Silversides*, and *Trigger*. In the spring of 1945, the *Tirante* prowled into a Japanese harbor to sink shipping under the nose of the enemy's shore guns. Such forays were typical of the aggressive attrition campaign waged by American submarines throughout the war.

SUBMARINE TENDER
The submorine tender follows the submorines to odvonced boses ond provides quick service to cut down "deod" time. In oddition to the functions it performs for the subs, it provides mony services for the welfore ond morole of the crew.

Submarine Special Missions

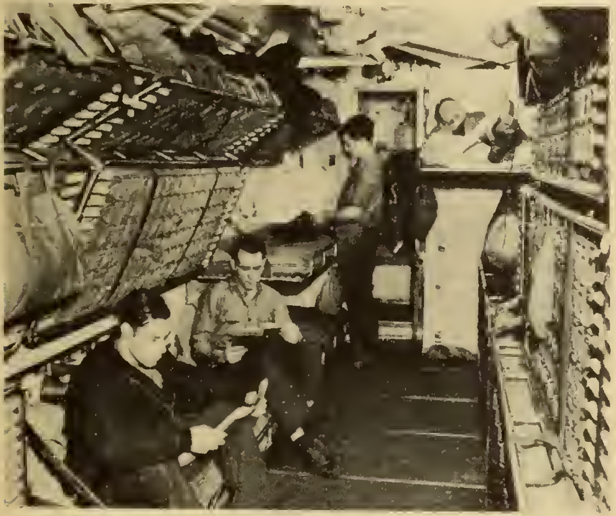
From the start of the Pacific war, our submarines proved their versatility as blockade-runners, transports, scouts, vedettes, passenger carriers, and rescue vessels. During the Solomons offensive, the submarines of Task Force 42, based as Brisbane, Australia, supported the operations of Admiral Halsey's fleet with scores of special missions. Secret agents were landed on enemy-held islands, refugees were evacuated, and enemy naval bases were reconnoitered.

Submarines *Nautilus* and *Argonaut* carried Carlson's Raiders to Makin Island. A few months later, the *Nautilus* and *Narwhal* were transporting troops to the front in the Aleutians. One of the famous special missions of the war was performed by the *Trout* when she carried out a treasure of gold and silver from embattled Corregidor. Submarines evacuated many

Army and Navy officers and men from the Philippines, and rescued several hundred refugees during the Japanese occupation. Typical of the missions in that area were the blockade-running junkets of the *Narwhal*, rushing supplies and equipment to the guerrilla forces in the islands.

After the Gilberts campaign, all amphibious strikes in the Marshalls, Carolines, Bonins and Nansei Shotos were preceded by submarine reconnaissance missions. Periscope photography was a feature of these exploits, and assigned tasks included weather reporting and exploration of beachheads. Submarine lifeguarding was an enterprise in which the United States Submarine Force took particular pride. Beginning with the Gilbert Islands offensive, submarines were stationed off target objectives to serve as lifeguards and rescue downed aviators. This activity was continued with singular success for the remainder of the war. During air strikes, the submarine *Tigrone* rescued 31 aviators; *Tang* rescued 22; *Gabilan* and *Guavina* each rescued 17. Altogether 504 airmen were saved by lifeguard submarines.

By the successful accomplishment of these manifold and various duties, submarines proved conclusively that there was hardly a feat on or under the sea impossible to a modern submersible with its well-trained crew.



SUBMARINERS IN THE BUNKROOM
Some use is made of every inch of space in a submarine. This scene is in the USS *Haddo* (SS255), commissioned in October 1942.

ENGINE ROOM OF USS *CUTTLEFISH* (SS171)
Powerful twin diesels are used for submarine propulsion. Formerly used only when surfaced, the diesels can now be used for submerged operation if the sub is equipped with snorkel.

Torpedoing the Japanese Navy

Perhaps the proudest accomplishment of the United States Submarine Force in World War II was the devastating blasting dealt the Imperial Navy. The first destroyer downed by American submarine fire was sunk by S-37 on 8 February 1942, off Makassar City. Before the war's end, over 30 Japanese DD's were downed by American submarines. Within a four-day period in June 1944, USS *Harder* demolished three in a row. It was open season on DD's by that time, and the submarine hunter had become the hunted.

First major warship sent to the bottom by submarine fire was the aircraft carrier *Soryu*, disabled by dive bombers in the Battle of Midway, then finished off by the *Nautilus*. The heavy cruiser *Kako*, sunk by S-44 off New Ireland on 10 August 1942, was the next major sinking. In December 1943, the *Sailfish* torpedoed and sank the escort carrier *Chuyo* on the road between Truk and Honshu. But 1944 saw our submarines wading into an all-out drive against the Imperial Navy. Highlighting this tremendous undersea offensive were the following submarine successes:

Aircraft carrier *Shokaku* sunk on 19 June by the *Cavalla* in the Philippine Sea. Aircraft carrier *Taiho* sunk on the same day in the same area by the *Albacore.* Aircraft carrier *Shinano* sunk on 20 November by the *Archerfish* off Honshu. Battleship *Kongo* sunk on 21 November by the *Sealion* off Formosa. Aircraft carrier *Unryu* sunk on 19 December by the *Redfish* in the East China Sea. In August and September of that year, the *Rasher* and the *Barb* sank the escort carriers *Taiyo* and *Unyo.* Submarines *Dace* and *Darter* sank a pair of heavy cruisers in Palawan Pass on 23 October. The *Ray* sank another on 6 November and eight light cruisers were demolished by American submarines during the same year.

By the end of 1944 the Imperial Navy's back was broken. And by VJ-day 201 Japanese naval vessels had been sunk by American submarines for a grand total of 540,000 tons.

The final submarine score tells a never-to-be-forgotten story. During World War II, American submarines in the Pacific sank 1,113 Japanese merchant vessels (4,779,902 tons) and 29 percent of the Japanese naval vessels sunk by all agencies during the conflict. The casualties—374 officers and 3,131 men—were painful. But the achievement stands as a monument to the greatest submarine force in history.

MINE WARFARE

Origins and Development

Submarining and its various aspects may dominate the topic, but no chapter on undersea warfare can be complete without a discussion of mine warfare. Mine warfare has been defined as "the strategic and tactical use of mines and mine countermeasures in the conduct of war." The subject includes offensive and defensive minelaying and the measures for mine clearance (of one's own or the enemy's mines) and protection against mines.

Stemming from attempts by the ancients to protect their harbors with underwater obstructions and snares, mine warfare probably antedates submarining in its origins. Although the mine (originally called a torpedo) did not come into general use until the Civil War era, efforts to produce an explosive charge which could be detonated under or against the hull of an enemy vessel were doubtless begun in the early days of gunpowder. The requisites—a watertight container and a trigger or other mechanism to detonate the charge—were comparatively simple. Complexities arose in the methods of controlling the device and bringing it into contact with the target.

Progenitor of the modern mine was Bushnell's powder keg carrying a delicate trigger and set adrift in the Delaware in December 1777, its target the blockading Red Coat Squadron downstream. An unfortunate current and a mossbacked officialdom defeated this Yankee invention. It remains on record, however, as the first contact mine of the floating type to enter the American service.

The possibilities of such a weapon were not to be overlooked by that great genius of nautical invention, Robert Fulton. Campaigning for the undersea boat in the court of Napoleon, the American inventor simultaneously came up with a "torpedo-mine" which was detonated by a contact trigger and succeeded in blowing apart a hulk in the harbor of Brest. Somewhat unaccountably the French naval officials branded the device as "immoral" and "contrary to the laws of war." Fulton thereupon took his inventions to England where British conservatives regarded his "coffers" (torpedoes) with cold skepticism. The skeptics were then horrified when, in October 1804, one of Fulton's mines destroyed an enemy vessel during the invasion of Boulogne.

Fulton followed this remarkable demonstration with an even more remarkable letter to the British Prime Minister, declaring that the English Channel could be mined from Dover to Calais and undersea warfare could "sweep all military marines off the ocean." This comment drew from shocked Admiral Jervis (Lord St. Vincent) the remark that the Prime Minister was "the greatest fool that ever existed, to encourage a mode of war which they who command the seas do not want, and which if successful would deprive them of it." Paid £15,000 for his unwanted services, Fulton returned to the United States where he continued his mine experiments with some backing from Congress. His "torpedoes" were used on at least one occasion during the War of 1812. But the greybeards considered them unorthodox, and the British, who feared innovation, branded Fulton's mines as "infernal machines."

Fulton's torpedoes were detonated by contact triggers and clockwork devices. During the war between Prussia and Denmark (1848-1851) the Germans produced an anchored mine which was exploded by an electrical device controlled from the shore. These mines were planted in the harbor of Kiel—the first defensive mining operation in history. Four years later, in the Crimean War, the Russians employed contact and electric mines to defend their Baltic and Black Sea harbors. Several ships of the attacking British-French-Turkish fleet were damaged by contact mines. But the Russians were unable to defend the minefields, and enemy vessels on the lookout fished up the mines with impunity—an early example of minesweeping. Again, the Austrians planted electrically controlled mines during their war with France and Italy in 1859. Results were negative. But by the eve of the American Civil War the mine was an established weapon. Fired by contact or electricity, it was anchored as a channel barrier or set adrift to float offensively against the enemy. The Union Navy found it a major menace.

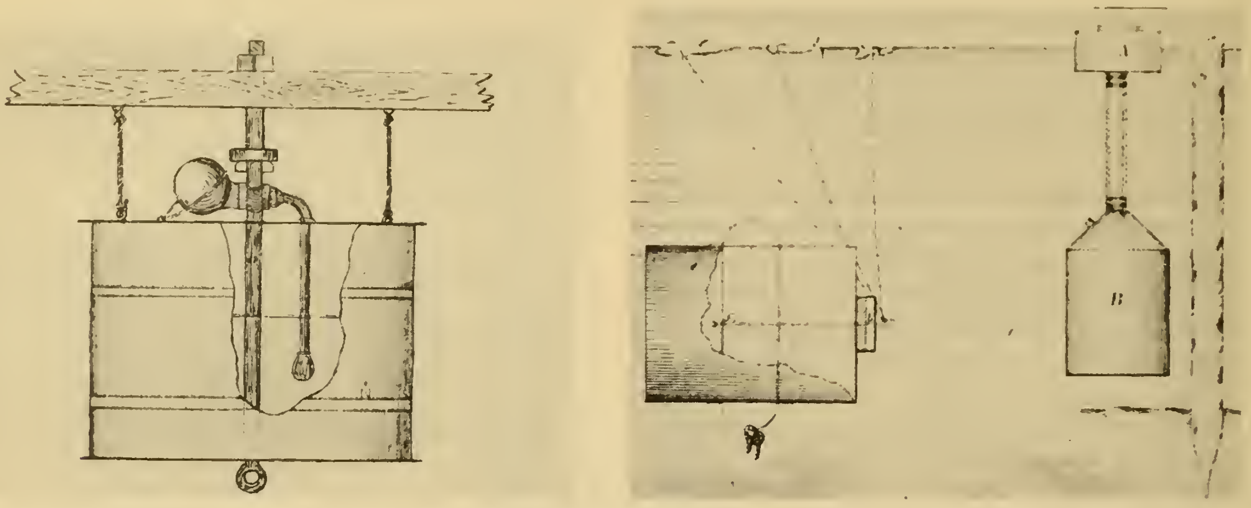
Damn the Torpedoes—Full Speed Ahead!

As the mine was employed primarily as a weapon to guard harbor entrances and channels, the Confederates found it peculiarly suited to their defensive war. Hampered as they were by industrial inferiority, they were unable to produce mines for extensive use until the third year of the conflict. But they enjoyed a singular technological advantage in the person of Commodore Matthew Fontaine Maury, the distinguished naval scientist who sided with the Confederacy.

Resigning from the United States Navy, Maury went south with plans for an electrically detonated mine, but lack of material forced him to revert to the older contact device, and the first Confederate mines, used at Hampton Roads in July 1861, proved unsuccessful. The Richmond leaders continued to back Maury, Hunter Davidson, and other Southern inventors, and as the war progressed the Confederates placed increasing reliance on mines to defend their rivers and exposed coastline. A variety of anchored mines, floating mines, semi-drifting mines, and "spar mines" were used. Some were fired by contact, others by electricity, and one ingenious "drifter" was propelled by a screw mechanism. These Confederate mines had their counterpart in Federal underwater weapons. But as the Federal Navy conducted the blockade and aggressively pushed the invasion, it suffered most from the new devices of undersea warfare.

Because of their low freeboard and relative lack of buoyancy, Federal ships of the monitor type were particularly vulnerable to mines. Attacking the Confederate cruiser *Nashville* off Fort McAllister in February 1863, the monitor *Montauk* was disabled by a mine. Driving down the Mississippi, Federal warships were encountering floaters and anchored "torpedoes," and by this time strategists had formulated the axiom that the best protection against mines was to steer clear of them. Yet the Union Navy could not permit its advance to be blocked by this defensive weapon. Naval minds in Washington had been busy devising countermeasures, and one of the first mineclearing engines was ready for the invasion of Charleston Harbor in the spring of 1863. This was the "boot-jack" invented by John Ericsson—a sort of raft which was fitted to the prow of a monitor where, thrusting ahead, it would detonate any mine encountered. Equipped with a "boot-jack," the monitor *Weehauken* led the Federal Squadron into Charleston Harbor, but a heavy sea forced the craft to abandon the mineclearing attempt.

Farragut's penetration of Mobile Bay remains one of the more dramatic episodes in the history of mine warfare. Flanked by Fort Gaines and Fort Morgan, the wide entrance to Mobile Bay was blocked by piling which forced shipping to navigate a channel under the guns of Fort Morgan. This channel was planted with some 180 mines which were strung out in lines designed to leave a narrow passage within point-blank range of the shore batteries. Left open for Confederate vessels, the passage was considered a deadly trap for the enemy invader whose ships



CIVIL WAR MINES
Left, semi-drifting mine; right, anchored mine.

would be squeezed between the "torpedo" lines and the fort. It was into this bottleneck that Farragut boldly ordered his Federal Squadron.

This use of mines to force enemy shipping into a channel covered by shore batteries was an early demonstration of a mining tactic that later became standard. Given a more reliable model with a better explosive device, the Confederates might have frustrated Farragut's forthright attempt. With one death-dealing exception, the Confederate "torpedoes" proved duds. Long immersion in salt water had caused them to deteriorate and had drawn their teeth.

But Farragut had no reason to suspect his squadron's security on the morning of 5 August 1864, when he ordered his 18 warships to enter the fateful channel. The mines were in plain evidence, their location marked by a string of black buoys. Farragut planned to transit the narrow passage, attack the Confederate warships in the bay, and then reduce the forts from the rear. He ordered his ships to stay in deep water and to move steadily forward, making no turn until the "torpedo line" had been passed. Equipped with gear to pick up the mines, the *Brooklyn* led the parade of wooden warships. A column of monitors led by the *Tecumseh*, moved on the flank. Someone mistook the orders, and the monitor *Tecumseh*, veering off to fire at a Confederate ironclad, struck one of the submerged mines. There was a thunderclap explosion, and the Federal monitor went down. The *Brooklyn* tried to turn away and blocked the advance. A hot fire from Fort Morgan raked the disorganized line. Farragut heard the cry, "Torpedoes!" The old admiral shouted from his flagship's rigging, "Damn the torpedoes! Full speed ahead!"

As the Federal warships pushed on, their crews heard the scrape of iron against keel and the snapping of primers and kicked trigger-mechanisms. But the watchdogs failed to bite—not another torpedo exploded. Thus was dramatized the problem of mine deterioration, a baffler that modern science has not yet entirely solved.

While mines did not play a decisive part in the Civil War, they struck a blow of considerable impact, costing the Federal Navy 7 monitors and armored gunboats, 11 wooden ships, and serious damage to a number of other vessels. Had the Confederacy been able to produce them in quantity at the war's outbreak, they might have turned the tide against "Abe Lincoln's Soapbox Navy."

Modern Mining Operations (World War I)

In the latter part of the 19th century naval strategists were inclined to discount the mine's effectiveness. Critics pointed out that the mine could be swept up with relative ease, or destroyed by gunfire and countermining, that is, sowing controlled mines in an enemy minefield and destroying the field by exploding the controlled mines. Yet the mine proved a standing menace in the Spanish-American War, and the threat caused American naval commanders to move cautiously off the coasts of Cuba. In the Russo-Japanese War (1904-1905), anchored mines took a heavy toll of combatant vessels. While blockading Port Arthur, the Japanese lost two battleships to mines in a single day, and one Russian battleship was destroyed by a Japanese mine.

During World War I both Allied and Central Powers engaged in extensive mining operations. Turkish mines laid in the Dardanelles frustrated a British-French attempt to penetrate the Sea of Marmora in March 1915. The French battleship *Bouvet* struck a mine and went down. A short time after that, HMS *Inflexible* was disabled by a mine, and a few minutes later HMS *Irresistible* was fatally stricken in the same minefield. Then HMS *Ocean* was sunk by a mine as she steamed to the aid of the *Irresistible*. Loss of these battleships discouraged the British admiral from continuing the bombardment of the Turkish forts. By fending off the Allied thrust, the Dardanelles minefields enabled the Turks to strengthen their fortifications, and as a consequence the British drive on Gallipoli ended in costly failure.

Throughout the war, German mines imperiled British shipping in the Channel. British efforts at offensive mining, notably in Heligoland Bight, were frustrated by efficient German minesweepers supported by the High Sea Fleet. The clearing of enemy minefields became a major endeavor of the rival navies. Standard mine of the war was the spherical model studded with wart-like "horns"—an anchored contact mine. As related earlier in this chapter, the German U-boats emerged as minelayers, and in this capacity threatened the American Atlantic Coast as well as the approaches to the British Isles. To eliminate this menace, the British Minesweeping Division developed the paravane or Otter gear—a wirecutting device that was affixed to the bows of sweepers and other ships and served to cut the mooring cables of anchored mines. The paravane was a considerable success and was much in use in the latter part of the war.

The tremendous North Sea mine barrage climaxed the mining operations of World War I. As previously noted, the American antenna mine in mass production implemented this endeavor which spelled defeat for the U-boat. No less than 57,000 of these mines were planted by American minelayers, and some 13,000 by the British. Premature explosions hampered the effort, but the enormous field was sufficiently lethal to turn back the U-boat, and it may be said that American mines sank the last German hope of victory in 1918.

Mining Operations in World War II

Mine warfare of World War II featured the influence type of sea mine and submarine and aircraft mine plants. Defensive mining was carried out in the main by the conventional types of surface minelayers, and mine clearance was accomplished by surface craft with special minesweeping equipment. Countermeasures included novel devices for protection and detection, and for the most part the Allies were able to frustrate the enemy's mining endeavors.

MINES CAN BE LAID FROM AIRCRAFT
A B-29 parachutes the deadly capsules into the sea on a minelaying mission.

In the opening months of the war, Nazi submarines and aircraft sowed deadly fields off the English and Scottish coast. During November and December 1939, a number of British ships were sunk by this mine barrage which was particularly heavy in the Thames Estuary. So the Allies encountered one of Hitler's secret weapons—an influence mine that was exploded by the action of a magnetic needle coupled to a detonating mechanism and activated by the magnetic field of a steel-hulled ship. The Nazis employed a variety of these mines, some of them anchored and others designed to rise from the bottom when a ship passed overhead. But the magnetic mine was hardly in action before the British produced effective protective measures.

Chief of these was the degaussing belt, a system of electrical cables which were fastened to the hull of a steel ship and carried currents of electricity that neutralized the ship's magnetic field. The device developed as a major anti-mine shield for Allied shipping in the war. Countermining was also successfully employed for clearance. An alert system of mine watching was instituted, air and surface patrols maintained sharp lookouts over dangerous areas, and intelligence sources supported the protection effort. Vessels equipped for mine detection, mine disposal, and for laying can (marker) buoys accompanied the sweepers on clearance missions. The magnetic mine, lying on sea-bottom, was not easily swept up. But it was squelched by degaussing, and Nazi offensive mining operations were a disappointment to the Axis leaders.

Defensive minefields were not thus easily circumvented. When the United States entered the war, the Allies, faced with the problem of mounting an offensive, were confronted by Japanese minefields in the Pacific and enemy fields guarding the European Atlantic coast and Mediterranean.

Hitler boasted that his forces would repel any assault on his Atlantic wall in exactly nine hours. Shoring up that wall were complex minefields which extended from Norway to Spain. As a preliminary to the Normandy landings in June 1944, the Allies conducted intensive minesweeps. Into action went the famous UDT's (underwater demolition teams) which had their origin in the amphibious campaigns of the Pacific. The task of clearing underwater obstacles and mines by demolition charges carried in and planted by swimmers was a Homeric endeavor calling for the utmost in courage, skill, and physical endurance. In their mineclearing exploits, the American UDT's performed some of the greatest feats of the war. Leading the first wave at Utah Beach, they cleared wide passages for the assault forces. At Omaha Beach, fighting through a maze of snares and traps, they were able to slash only a narrow passage. In this action they lost almost half of their force.

UNDERWATER DEMOLITION

Members of the underwater demolition teams (UDT's) cleared out with explosives natural and man-made obstacles lurking off the beaches chosen as objectives of amphibious landings. After the charges have been placed and the fuses set the UDT man usually has to get away quickly.

That mines remained a dangerous threat to the last is evidenced by American ship losses off Normandy where three destroyers, a destroyer escort, two minesweepers, two transports, a submarine chaser, and a number of landing craft were sunk—most of them by mines.

Mine Warfare in the Pacific

In the Pacific, as in the Atlantic, the combatants employed minefields to defend their major bases and harbors, and laid offensive fields to destroy or divert enemy shipping. The entrance to Pearl Harbor, the mouth of Manila Bay, the approaches to Singapore, the Japanese bases in the Mandates, and the coasts of Japan were all guarded by minefields. American submarines probing into Empire waters, and the Japanese fleets attacking Hawaii and the Philippines were forced by mines to proceed warily.

United States submarines laid the first offensive minefields for the Allies in the autumn of 1942. In October USS *Thresher* planted magnetic mines in the Gulf of Siam. Other submarines carried these mines to the Indo-China coast, and late in the year USS *Whale* laid mines off the coast of Japan. For our submarines, minelaying was a secondary enterprise, as these craft were dedicated to torpedo warfare and carried mines only so long as there was a torpedo shortage and stowage space was available. The submarine minelaying effort was not notably successful. Numerous prematures were reported and results were meager. Only six or seven Japanese ships seem to have been destroyed by submarine-laid mines, and the effort was eventually abandoned.

The Japanese laid a vast minefield in the East China Sea, west of the Nansei Shoto, and throughout the war this field protected their shipping in that area. Japanese mines were also scattered in the Yellow Sea and minefields effectively guarded the entrances to the Sea of Japan until the closing months of the war. The loss of three American submarines was almost certainly caused by mines, and five others that failed to return from patrol may have been destroyed by mines.

UNDERWATER PHOTOGRAPHY
Divers took cameras to the bottom to make this picture for the Navy's Mine Disposal Service.

Allied minesweepers performed ably in the Pacific, and in shallow waters where the YMS (motor minesweeper) could not safely work, underwater demolition teams operated with the amphibious forces. Special mine-disposal units joined in the clearance tasks, and shallow-draft landing craft were fitted with light emergency sweeping gear to assist in these operations. The mine is an impartial weapon which can be dangerous to friend as well as foe. Obviously minefields cannot be laid indiscriminately, and elaborate systems were developed whereby friendly forces were informed of mine locations, and channels were provided for safe passage. Mine plants were authorized only when approved by area commanders in accordance with planned naval operations. Responsibility for the ultimate clearance of defensive minefields imposes definite restrictions on mining operations, and devices were developed to control the active life of mines and thus facilitate post-war minesweeping. After World War I, many derelict mines endangered ship traffic, but the mines employed by the Allies in World War II were designed to aid eventual clearance.

In the Pacific a few PT boats operated as special minelayers and on occasion the old, fast DM's supplemented the newer types. An innovation was the B-29, employed as a minelayer in 1945. Prior to that date, aircraft minelaying operations were limited, and the Allied offensive mining effort was, with the exception of the Yangtze blockade, negligible.

In March 1945 the Twentieth Air Force began a mine campaign designed to end shipping in Japanese coastal waters. Major target was Shimonoseki Straits. Eventually all important Japanese and Korean seaports were mined by the B-29's, and over 670,000 tons of shipping were sunk or disabled by this tremendous barrage. The Japanese were unable to clear the clogged channels. The mines dropped (sound mines, pressure mines, magnetic mines, and variations of these types) were not easily swept up, and the Japanese lacked equipment for the task.

In conjunction with this offensive mining campaign, United States submarines entered the Sea of Japan with a new mine-detecting device that neutralized the Japanese minefields defending that body of water. With her defensive fields impotent and her ports blockaded by submarines and mines, Japan was in a vise and defeat was inevitable.

Conclusion

Mine warfare was reaching an offensive peak when hostilities were ended in the Pacific. In a little less than a century the mine had developed as a potent undersea weapon. Employed offensively and defensively it had turned the tide of battles, frustrated invading forces, and destroyed naval vessels of the largest class.

In World War II its effectiveness was considerably reduced by protective gear and detection devices. Japan's war effort was expiring when the mining offensive was launched against her. Technologically weak to begin with, the Japanese were unable to produce first-class mine countermeasures. Given adequate detection apparatus, ships may easily elude mines and otherwise vitiate their menace. Subject to deterioration and mine dip caused by sagging cable, the moored mine is not too reliable a weapon, and its immobility inhibits its value. But in all probability minefields will continue to guard important harbors and channels against invasion and will constitute a threat to wartime shipping. No modern naval commander would dare to defy the menace with a mere, "Damn the torpedoes, full speed ahead!"

CHAPTER 20

AMPHIBIOUS WARFARE

INTRODUCTION

Need for Knowledge

The subject of amphibious warfare has special significance for every officer in the Naval Service. Whether he is assigned to duty at a shore station or on board ship, during war or peace, he will undoubtedly find himself concerned sooner or later with some one of its many phases.

Specialized Warfare

This highly specialized type of warfare came into its own during World War II. The tactical and strategical considerations of the recent conflict required on numerous occasions the transport of large numbers of troops and enormous amounts of equipment in an overwater assault for the purpose of effecting a landing on a hostile shore. This type of warfare is called an amphibious operation.

Amphibious operations require the use of much specialized material and equipment. An operation that is designed to land troops on a hostile shore necessitates the employment of many different types of craft, each possessing the special characteristics necessary to accomplish its assigned mission. The extreme importance of exact timing and absolute control, which are especially essential in an amphibious operation, necessitates the use of an exceptionally complex communication system. In the field of tactics and techniques, amphibious warfare is again found to be unique. The tactics and techniques used must include provisions for the employment of ground and. air, as well as naval elements.

Unified Command

Amphibious forces in operation may include personnel from nearly every branch of the Armed Forces —Navy, Marine Corps, Army, Air Force, and Coast Guard. Under the same unified command these forces are integrated to form a single cohesive amphibious striking force, capable of executing its assigned mission with utmost efficiency. The keynote of successful amphibious operations is the complete cooperation and unity of effort between all the participating elements of our land, sea, and air forces. The successes achieved in the conduct of many joint amphibious operations during World War II are historical evidence of the results of the close relationships that existed among our Armed Forces.

Seizure of Advanced Bases and Land Areas

To be successful in war, forces must fight offensively. It follows, then, that war must be carried to and fought on enemy soil. This offensive doctrine often results in the lengthening of lines of supply and communications, thus increasing their vulnerability to enemy attack. To prevent this condition, operations must be conducted from advanced bases near the theater of operations.

Advanced bases are the locations from which the fleet, or portions thereof, may operate. At the outbreak of possible future hostilities, this country may possess bases similar to those held by us during the initial stages of World War II. It is conceivable, however, that some of the bases which are now in our possession may fall to the enemy.

LANDING CRAFT APPROACH TO PICK UP TROOPS
Through a porthole on a troop transport, soldiers see assault craft circling to take them aboard and transport them to the beaches.

(Before we were able to deliver the decisive blows that finally brought us victory in the Pacific, it was necessary to recapture many important bases in the possession of the enemy.)

In addition to the occupation of bases, the waging of offensive warfare dictates the seizure of enemy land areas for the conduct of future land operations. An illustration of this type of operation is the landing at Salerno which paved the way for the employment of large land armies on the mainland of Italy.

Surface, Subsurface, and Air Transport Use

The seizure of advanced bases and land areas usually requires that troop elements be landed on hostile shores to close with and defeat the enemy and eventually occupy the area. Since the United States occupies a geographical location that is bordered on the north and south by friendly nations and is bounded on the east and west by large ocean masses, it is evident that any extensive offensive action undertaken by this nation will be by necessity an overwater assault. Such an assault may be carried out by surface, subsurface, or air transport, or possibly by a combination of all three. Recent developments in subsurface and air transport are promising, although there are many problems yet to be solved before they can be adopted as a basic means for transport.

The gigantic task involved in transporting the cargo required for the support of an amphibious operation by air is illustrated by Fleet Admiral Chester W. Nimitz, in his statement: "100,000 long tons of cargo, which 44 ships can transport from San Francisco to Australia monthly, would require for the same purpose 10,000 four-engine C-87 airplanes manned by 120,000 highly trained personnel, plus 89 seagoing tankers to provide gas along the route and at the far end of the run. Cargo-carrying aircraft will no more replace vehicles of the same type on the seas than they will those on land."

Present Interest in Field

The present interest of the Navy in amphibious warfare is derived from the naval policy of our country which requires the fleet to be prepared for the conduct of major landing operations in any portion of the globe. New types of weapons will not alter this basic mission, although techniques and procedures may be expected to change to meet new developments.

HISTORICAL BACKGROUND

Amphibious Operations Not New

World War II produced the greatest series of landing operations in history. Their magnitude, both in number and size, and the diversity of the landings in the Pacific, in Europe, in the Mediterranean, and in North Africa, tend to create the impression that the amphibious operation is a new type of military enterprise, particularly since in modern times and until World War II there have been few large-scale amphibious operations. Actually the amphibious operation is not new. Military history contains many instances of landing operations conducted in all parts of the world since the early times when man first crossed the sea to wage war.

Earliest Recorded Landings

One of the first landing operations of which there is a record dates back nearly 3,000 years. This was the half-legendary attack of the Greeks upon the city of Troy in Asia Minor near the Dardanelles. Homer's *Iliad* relates that the Greeks crossed the Aegean Sea, stormed the beaches near Troy, and after ten years of war destroyed that city.

The powerful Persian ruler, Darius, launched a waterborne attack against the Greeks about 700 years later. In 490 B. C., Darius constructed an especially designed amphibious fleet for an attack on Athens. His shipbuilders developed a remote ancestor to the modern landing craft, a ship with a runway for horses. Darius was successful in his landing but met defeat inland.

History records many similar operations; some were successful, some failed. A few of these assaults from the sea shaped or changed the history of entire nations. In 56 B. C., Julius Caesar landed two Roman legions north of the Thames River and defeated the reigning English king. By 50 A. D., the Romans had expanded this early beachhead until nearly all of southern England was a province of their empire. Since they remained for four centuries, the results of this amphibious operation were of lasting importance.

One of the most important waterborne invasions in history occurred in 1066 when William the Conqueror crossed the English Channel to Britain with what was a sizable army for those days. At Hastings, near the scene of his landing, William defeated Harold, the Saxon King, and founded a new line of rulers.

The list of amphibious landings from 1066 to the American Revolution is too long to relate in detail but it may be of interest to note a few more of the main operations. In July of 1346, the English invaded Normandy, almost 600 years before D-day in World War II. The summer of 1588 saw the combined efforts of the English fleet and adverse weather conditions smash the Spanish Armada in its attempt to invade the English homeland.

Early Landings by American Forces

The first amphibious operation conducted by the United States occurred in 1776 when a party of Marines and bluejackets effected a landing at Nassau in the Bahamas. From that date until 1941, Marines had participated in some 180 landing operations. Amphibious operations of this period included landings at Vera Cruz in 1847 during our war with Mexico. The Civil War saw many landings, some spectacularly successful, some costly failures.

It was not until 1898, however, that the first large-scale training in landing operations began. At that time a battalion of Marines, consisting of five rifle companies and a battery of three-inch artillery, was organized as a fleet landing force. This organization carried out intensive training designed to develop a technique for rapid ship-to-shore movement and landing tactics. The benefits of this training were soon realized in the attack and seizure of Guantanamo Bay for use as a base for the fleet during the Spanish-American War. Of paramount importance is the fact that this effort was the commencement of a trend toward regularly organized units trained for this type of operation. The succeeding years saw increased use of organized units based on transports of the fleet taking part in numerous landing exercises in the Caribbean area. As early as 1902, special training was undertaken in advanced base operation, and an advanced base regiment was organized and carried on training with the fleet.

Landings in World War I

World War I gave us our first classic example of modern, large-scale landings. The combined operations conducted by the British during the Dardanelles campaign in 1915 represent an instance in modern times prior to World War II of an assault landing by a major force on a hostile and defended shore. In the assault landings on the Gallipoli Peninsula where the beaches were unopposed or lightly defended, troops landed with few or no losses; however, extremely heavy losses were suffered at the strongly defended beaches, even though the troops were successfully put ashore. Nevertheless, in the months that followed, the land operations for the seizure of the Gallipoli Peninsula were unsuccessful. In fact, for a number of reasons, a secure beachhead never was established. Although cooperation between troop and naval elements was excellent, the logistic build-up on the beaches never was adequate, and communications remained primitive. The landing forces were finally

PRACTICE MAKES PERFECT

Marines in training make a practice landing. Much of the success that was attained in amphibious warfare in the past war was due to the realistic training received beforehand.

evacuated in January of 1916 after a campaign lasting eight months and the impracticability of attempting landings against opposition apparently was demonstrated conclusively.

Developments Between World Wars

During the 25 years between Gallipoli and Guadalcanal, the United States developed the doctrine, organization, tactics, and techniques necessary for success in this difficult and complex type of warfare. The Marine Corps was responsible for perpetuating the developments in amphibious warfare during this period. In 1921, John A. Lejeune, Major General, Commandant of the Marine Corps, directed Marine Corps Schools to launch a full-scale attack on the problem of amphibious warfare, to study existing techniques, analyze the reports of landing exercises, and evaluate the failures or successes of historical landings in war. In addition to actually carrying out landing operations during this period, the Marine Corps and Navy were able to establish a workable doctrine for both troop and naval components of an amphibious attack force. Advancement in equipment progressed at the same time, but unfortunately its tempo was less rapid, due primarily to lack of appropriations. In the period from 1929 to 1938, the Marine Corps Schools developed a series of tentative landing force doctrines, culminating in the *Fleet Tactical Publication 167* of 1938 (written in entirety at the Marine Corps Schools) which became the basic tactical document for the prosecution of amphibious operations against the Axis Powers. This publication, redesignated by the War Department as Field Manual 31-5, was issued to the Army three years later, in 1941, and governed that service's first ventures in the amphibious field.

The period between 1935 and 1941 was one of application, test, and experiment in the field of amphibious tactics. During this period, the newly organized Fleet Marine Force carried out the first modern landing exercises to be executed by United States forces. The doctrine that had been developed in the preceding years was therefore put to practical test by the Fleet Marine Force (for which it had been promulgated) and its efficiency was demonstrated. Organization, weapons, and equipment were tested in actual use, and recommendations were made for further development. The doctrine was also supplemented with new techniques evolved in training and directed mainly at improving coordination of participating air, ground, and surface elements.

Amphibious Operations in World War II

Fortunately, the United States entered the last war in the enviable position of knowing more about amphibious operations than any other nation. Our dominating position in the field of landing operations did not come about by chance. It was the logical result of 165 years of specialized study and experience, culminating in the detailed techniques, doctrines, and equipment which later proved of such great value to our own Armed Forces and those of the Allied nations.

From our entry into the war at Pearl Harbor in December 1941 until the Japanese surrender at Tokyo Bay in September 1945, every major offensive cam-

DAWN ATTACK

Invaders, ready to go into action, cram the topside of an LST and watch the spectacle of invasion. Fleet units in the background are shelling enemy emplacements on the beach.

NORMANDY BEACHHEAD
Participating in the Normandy invasion was the greatest variety of vehicles ever assembled for a military operation. The rhino barges, a Seabee innovation, are constructed of pontoons.

paign launched by the United States was initiated by an amphibious assault.

Pacific Theater. The first American amphibious landings of World War II were made in the Guadalcanal campaign initiated in August 1942. In these operations, executed by the 1st Marine Division, Fleet Marine Force (then our only amphibious troops in readiness for war operations), the amphibious technique which had been developed was put to a test. The results were threefold: First, Japanese expansion into the South Pacific and Southwest Pacific was checked; second, the cutting of our vital sea lanes to Australia was prevented; third, it was demonstrated clearly by the United States Marines that Japanese land forces could be outfought and decisively defeated by American troops. This first victory came as a result of the intensive and exhaustive study, experiment, and training conducted during the preceding 20 years largely by the Marine Corps.

The remainder of the story of World War II is the story of offensive land operations based on amphibious landings of increasing magnitude. In the Pacific, the battles for the Solomons was followed by the occupation of the Russells on 20 February 1943 by Marine and Army troops. On 11 May 1943, Army forces seized Attu in the Aleutians. Marine Corps and Army units landed on Rendova and Vangunu Islands in June 1943. New Georgia, and landings on New Guinea, Bougainville, Tarawa, and New Britain—all Marine Corps operations—followed each other in rapid succession during the rest of 1943.

In the following year, came the amphibious assaults by Fleet Marine Force units against the coral atolls of Kwajalein, and Eniwetok in the Marshalls, landings on New Guinea, the occupation of the Admiralties, and the crucial assault and reduction of Saipan, Tinian, and Guam in the Marianas, again by the Fleet Marine Force. During the remainder of 1944, Peleliu and Angaur in the southern part of the Palaus, and then Leyte, Ormoc Bay, and Mindoro fell to our amphibious forces. In 1945 came the amphibious capture of Luzon, Iwo Jima, and Okinawa. Before the Japanese surrender in September 1945, we were preparing for the final assault—an amphibious assault—on the Japanese mainland and the destruction of the Japanese Army. The relentless pressure we were able to bring to bear on Japan from the naval and air bases gained by amphibious offenses was crucial to the success of the Pacific war, which was wholly and predominantly naval in character.

European Theater. Our entry into the conflict in the European theater was initiated by amphibious landings in French North Africa in 1942. The purpose of this invasion was to secure African bases from which we might carry the war to Sicily, freeing Great Britain's lifeline to India, and opening a way for the invasion of Italy and southern France. It was also undertaken to relieve the critical situation in the Middle East since it diverted some German pressure from the Russian Army. July 1943 found a huge armada of over 3,000 vessels and 160,000 men landing on the beaches of Sicily, an operation destined eventually to force Italy out of the war. Similar shore-to-shore landings on the mainland of Italy at Salerno were effected in September 1943.

The historic amphibious landings keynoting the invasion of Western Europe took place on 6 June 1944 over the Normandy beaches. The magnitude of a major amphibious operation is clearly illustrated by the Normandy landings. From 6 June to 27 July, 18 divisions, or approximately a quarter of a million Allied troops were put ashore. In the first 28 days, some 1,000,000 men, 183,000 vehicles, and 650,000 tons of supplies were deposited on the beachheads and in artificial harbors by a force of about 3,000 craft and some 15,000 men.

The last of the major amphibious landing operations on the European continent was carried out in southern France in August 1944, an operation that materially aided in the ultimate defeat of the German war machine in the west.

Value of Study of Past Landings

What has this brief review of amphibious warfare in past history shown? First, that amphibious operations are almost as old as recorded history. Second, many seaborne landings have been successful in the past and have helped to shape the course of history. Third, a generation ago it was evident that no adequate solution to the problems of successful invasion from the sea had been reached. Fourth, these problems were solved, at least for World War II conditions, by the Marine Corps and Navy in a manner that demonstrated that amphibious warfare can be tremendously effective. During that period it was the bridge that permitted us to close with and defeat our enemies. Lastly, from a study of past history, much can be learned and applied to the conduct of future amphibious operations.

ORGANIZATION FOR AN AMPHIBIOUS OPERATION

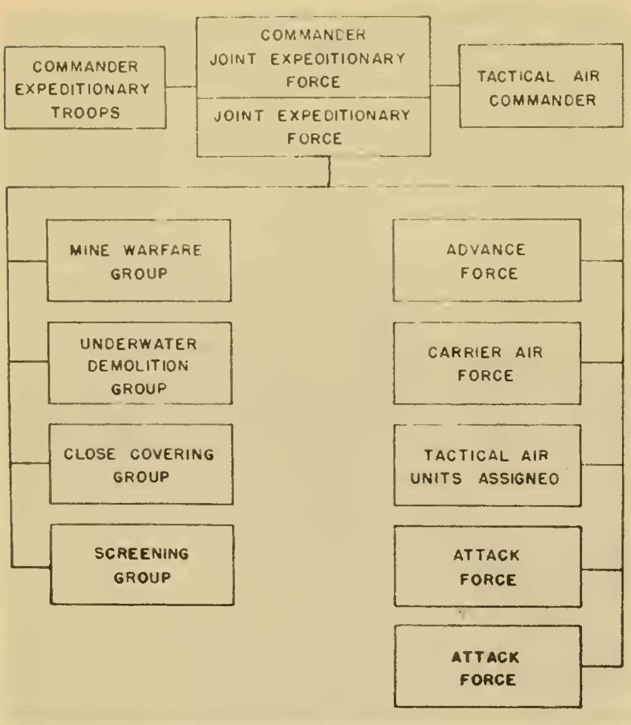
Amphibious Task Organization

An amphibious operation is not unlike a normal land or sea operation in that it requires the formation of a force specially organized for the accomplishment of each separate assigned task or mission. Such a force is called an amphibious task force. The size and composition are determined by the assigned mission.

Joint Expeditionary Force

An amphibious task force composed of land, sea, and air elements is normally called a naval expeditionary force, or, if forces or agencies of the United States Army and/or the United States Air Force are involved, a joint expeditionary force.

A joint expeditionary force consists of the follow-


COMMANDER JOINT EXPEDITIONARY FORCE
JOINT EXPEDITIONARY FORCE
COMMANDER EXPEDITIONARY TROOPS
TACTICAL AIR COMMANDER
MINE WARFARE GROUP
UNDERWATER DEMOLITION GROUP
CLOSE COVERING GROUP
SCREENING GROUP
ADVANCE FORCE
CARRIER AIR FORCE
TACTICAL AIR UNITS ASSIGNED
ATTACK FORCE
ATTACK FORCE

COMPOSITION OF THE JOINT EXPEDITIONARY FORCE

ing components: expeditionary troops whose mission is to effect the landing on hostile shores; sufficient ships and aircraft to transport the landing elements from their ports of embarkation to the objective area; and ample ships and aircraft to furnish protection for the forces en route and to support their landing at the objective.

In any military operation, success is greatly dependent on unity of command; therefore, one individual must be charged with the authority of coordinating the efforts of all the participating forces. He is responsible for the organization of the forces, assignment of their missions, designation of their objectives, and the exercise of such coordinated control as is considered necessary to insure success of the undertaking. In an amphibious operation, his title is Commander Joint Expeditionary Force.

The Commander Joint Expeditionary Force may be a naval, ground, or air commander. Under the principle of unity of command, the authority and responsibility for the over-all conduct of the entire mission are given to the commander of the Service whose function and requirements are of the greatest importance at the time of the operation. Since an amphibious operation is primarily naval in character, present doctrine prescribes that the Commander Joint Expeditionary Force normally be a naval officer.

The Commander Joint Expeditionary Force exercises over-all control of the air and land forces under his command through the Tactical Air Commander and the Commander Expeditionary Troops respectively. These commanders are normally embarked on the same flagship as is the Commander Joint Expeditionary Force.

Naval Components of the Joint Expeditionary Force

The principal naval components of the joint expeditionary force are: a mine warfare group, an underwater demolition group, a close covering group, a screening group, an advance force, a carrier air force, assigned land-based tactical air units, and one or more joint attack forces.

Naval Responsibilities in an Amphibious Operation

For a thorough understanding of the naval organization of the joint expeditionary force, a knowledge of the basic naval responsibilities during an amphibious operation is required. These responsibilities are fourfold:

First, the naval elements of the joint expeditionary forces must provide for preparation of the objective, that is, they must be used to create conditions as favorable as possible for the landing of troops on the selected beaches and to facilitate their advance inland to the objective.

Second, the naval forces must move the expeditionary troops from the embarkation ports in friendly territory to the landing beaches on the hostile shore.

Third, the naval forces must provide for protection of the joint expeditionary force during the overseas movement and in the assault area.

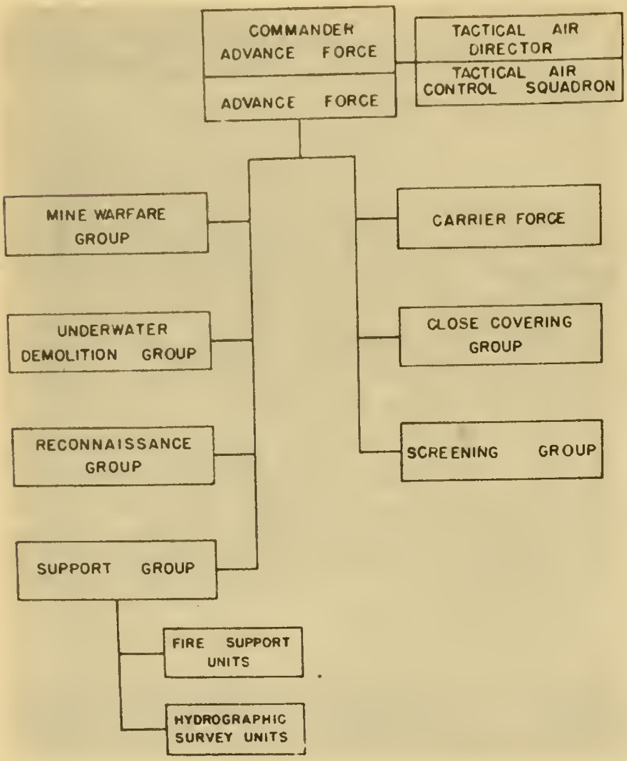
Fourth, the naval forces must support the troops ashore until a firm beachhead has been securely established, and the troops have been placed ashore in strength and have available all of their normal supporting weapons such as artillery and armor.

Preparation of the Objective. The first of these naval responsibilities, preparation of the objective, is accomplished by the creation of an advance force which is given the specific mission of preparing the objective for the assault. The advance force precedes the main body of the joint expeditionary force in order to complete its mission prior to the arrival of the troop convoy on D-day. It includes several groups or units, each under its own commander. These groups or units are capable of accomplishing each sub-task of the advance force mission. To achieve centralized and coordinated control of air operations, there is a Tactical Air Director who controls all aircraft in the objective area from the arrival of the advance force until the day of attack (D-day). The Tactical Air Director, along with a tactical air control squadron, is embarked in the flagship of the Advance Force Commander, thus enabling a very close liaison to be maintained.

As indicated by its title, the mine warfare group has the task of preparing the objective with respect to sea mines, both defensively and offensively. The ships of this group are principally minesweepers of several classes and their job is to discover and sweep clear any enemy minefields that might create a hazard to the joint expeditionary force. It may also have the additional job of laying minefields of our own to prevent enemy naval forces from gaining access to the landing area.

The Navy is responsible in joint operations for the destruction or removal of all man-made or natural obstacles, underwater or to seaward at the high-water mark, that interfere with the beaching of landing craft. Therefore, an underwater demolition group is created under the Advance Force Commander to accomplish this purpose, to reconnoiter the beaches, and to obtain information vital to the landing. The normal technique is to employ groups of swimmers who place

LANDING AT IWO JIMA
At the foot of Mount Suribachi, Marines plunge forward through enemy fire and rush inland to widen and strengthen their beachhead.



COMPOSITION OF THE ADVANCE FORCE

and detonate demolition charges against the obstacles; but occasionally special devices such as explosive-laden drone boats may also be used by this group to assist in the task.

A reconnaissance group may also be created to operate under the advance force for the purpose of attaining vital information relative to the objective area. Using submarines and flying boats and operating at night, these units are placed ashore, in some cases days or even months before the scheduled landings.

Another component of the advance forces is one or more support groups. The support groups are built around battleships, cruisers, rocket-launching vessels, and destroyers. Their main function is preparation of the objective. This is accomplished by means of extensive, deliberate naval gunfire bombardment directed against enemy coast-defense guns, blockhouses, pillboxes, radars, and observation towers, for the purpose of achieving maximum destruction of the installations, and thereby facilitating the job of the assaulting troops later on. In addition, they also provide support as needed for minesweeping, reconnaissance, and underwater demolition operations.

In the event the operation is to take place in unfamiliar waters, another phase of preparing the objective may be the obtaining of needed hydrographic data for the naval forces; therefore, another subdivision of the advance force may be one or more hydrographic survey units which will normally operate for this purpose under the protection of the fire support groups.

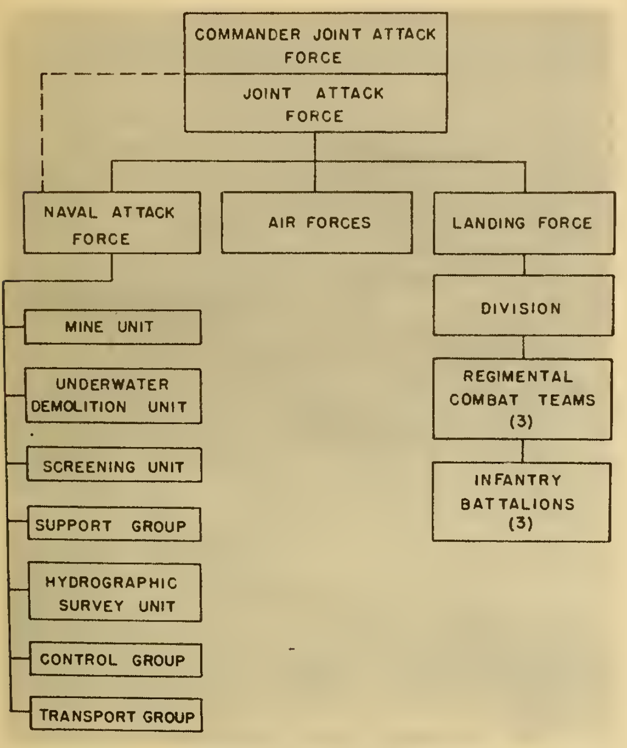
A carrier force normally comprises another unit operating under the Advance Force Commander. Consisting of aircraft carriers and screening vessels, this force assists in preparation of the objective by delivering air strikes against enemy installations in the landing area as planned and ordered by the Advance Force Tactical Air Director. It also furnishes air cover for the advance force.

Two other components of the advance force are the close covering group and the screening group. They have little to do with the advance force's basic mission of preparing the objective, but are organized to protect that force from enemy surface and submarine attacks during the execution of its task.

The foregoing are the basic elements of the organization of the advance force which is charged with the naval responsibility of preparing the objective for the landing of troops. Upon the arrival of the main body of the joint expeditionary force on D-day, the naval units that comprise the advance force revert to other commands within the joint expeditionary force.

Transport of Expeditionary Troops. The second major naval responsibility is to move the expeditionary troops from the embarkation ports to the selected beaches. The force created for this purpose is called the attack force. Depending upon the organization of the expeditionary troops, there may be one or several attack forces. The troop organization transported and landed by each attack force is known in amphibious terminology as a landing force.

The components of the attack force usually include a mine unit, an underwater demolition unit, a screening unit, a hydrographic survey unit, and a support group. These are subdivisions of mine group, screening group, underwater demolition group, and hydrographic survey group of the joint expeditionary force


COMMANDER JOINT ATTACK FORCE
JOINT ATTACK FORCE
NAVAL ATTACK FORCE
AIR FORCES
LANDING FORCE
MINE UNIT
UNDERWATER DEMOLITION UNIT
SCREENING UNIT
SUPPORT GROUP
HYDROGRAPHIC SURVEY UNIT
CONTROL GROUP
TRANSPORT GROUP
DIVISION
REGIMENTAL COMBAT TEAMS (3)
INFANTRY BATTALIONS (3)

COMPOSITION OF THE JOINT ATTACK FORCE

and are assigned to the Attack Force Commander to provide the protection and naval support required.

Another unit of the attack force is the control group. The control group may be composed of vessels of various types, such as destroyers, destroyer escorts, or smaller patrol craft. Its function is that of a traffic patrolman; that is, the ships of the control group are used to insure that all ships and landing craft are in the right place at the right time, and that the boat waves are formed properly and dispatched to the beach according to plan.

The transport group is the component of the attack force that actually moves the landing force to the objective and puts it ashore. The size and composition of the transport group vary with the particular circumstances surrounding any given operation and depend largely on the availability of shipping and the size and composition of the landing force.

Protection of Joint Expeditionary Force. The third naval responsibility is that of protecting the joint expeditionary force during the overseas movement and while it is at the objective. Two commands operating directly under Commander Expeditionary Force are created specifically for this purpose although for a time they, or some of their units may be under the Advance Force Commander. These forces are the close covering group and the screening group, and they are composed of battleships, cruisers, and destroyers, organized so as to repel any enemy surface or submarine attacks. The carrier force is another element of the joint expeditionary force utilized to protect the expedition by furnishing fighter cover and antisubmarine flights, although it has other responsibilities besides its protective function. An additional protective measure may be the utilization of a covering force, as distinguished from the close covering group. When used, the covering force is normally composed of fast carriers, battleships, cruisers, and destroyers. It operates in support of, but independent of, the joint expeditionary force, and its mission is to intercept at a distance the enemy surface forces that may sortie to interfere with the landing operation.

Air and Gunfire Support. The fourth naval responsibility affecting the joint expeditionary force is the

ROCKET LAUNCHERS
Huge rockets in their launchers aboard a rocket-firing craft. The rockets are light and mobile, but pack a terrific punch.

need to provide initial support of the troops ashore. This mission is accomplished by the organization of support groups under each Attack Force Commander to supply the necessary naval gunfire support in each landing area. The support groups consist primarily of battleships, cruisers, destroyers, and rocket-launching vessels. The gunfire support furnished for the units ashore takes the form of scheduled barrage fires lifted inland ahead of the advancing troops as well as both close and deep support call-fire missions. Interdiction, harassing, and night illumination fires are provided when needed. Tactical air units also assist in the support of troops ashore, when assigned to the attack force from the carrier force, through the attack force tactical air control squadron.

Landing Force Components of a Joint Expeditionary Force

The troops of all services assigned to a joint expeditionary force for operations ashore are called expeditionary troops. They include the troops that actually make the assault on the enemy beach as well as additional forces attached for the purpose of garrisoning the objective area after its capture. The command of these troops is the responsibility of the Commander Joint Expeditionary Force through the Commander Expeditionary Troops until such time as the latter establishes himself ashore and assumes the command responsibility.

Landing Force. Troops assigned under a single tactical command to carry out an assault of an objective are collectively termed the landing force. The actual composition of the landing force varies, depending on its mission, and may be as few as a thousand men or as many as a hundred thousand.

Example of Landing Force. An example of a landing force can be presented by developing the organization of a Fleet Marine Force division. This is a standard Marine infantry division somewhat augmented by additional combat and service elements, as dictated by the mission or task of the division. Supporting combat elements for attachment include any type or quantity of unit required to form a suitable landing force. These attachments may include additional armor, chemical weapons, field and antiaircraft artillery, engineer, amphibian tractor, armored amphibian, amphibian truck, and medical battalions, although the Marine division as distinct from that of the Army, embodies all special and supporting units normally required for an amphibious assault.

MARINES LANDING
Carrying their rifles high, Marines wade through a three-foot surf after leaving an LST. They immediately assemble at predesignated spots before pushing into the jungle.

The vast amounts of equipment and supplies that must be unloaded and moved to supply points to support a major landing operation and the peculiar difficulties encountered in such operations require the organization of a specially trained and equipped shore group to execute these logistical functions. This element is called the shore party.

The reinforcing units, combat and service, are normally attached to the Marine division for administration and tactical employment throughout the period of preparation for and execution of the landing and as long thereafter as required. The Fleet Marine Force division is provisionally organized for the landing into three regimental combat teams (RCT's). These three combat teams are the combat elements of the division and as such are the units responsible for the initial phases of an assault landing. Each combat team is given a proportionate share of the combat and service units of the Marine division to facilitate and insure that each will be a self-contained assault force.

As in the case of the division landing with its three regimental combat teams, each RCT has three battalions. During landing operations, these battalions are known and referred to as battalion landing teams (BLT's). For the movement from ship to shore, the landing force, in this example a Marine division, is subdivided into boat groups, each consisting of a battalion landing team or its equivalent, plus such miscellaneous elements of higher headquarters, liaison groups, or other units as may be embarked with it. The Marine BLT, consisting of approximately 1,300 officers and men, is considered to be the basic tactical unit for a landing operation and, like the regimental combat team, is landed as a self-contained initial assault force.

OPERATIONAL PHASES OF AN AMPHIBIOUS OPERATION

Planning

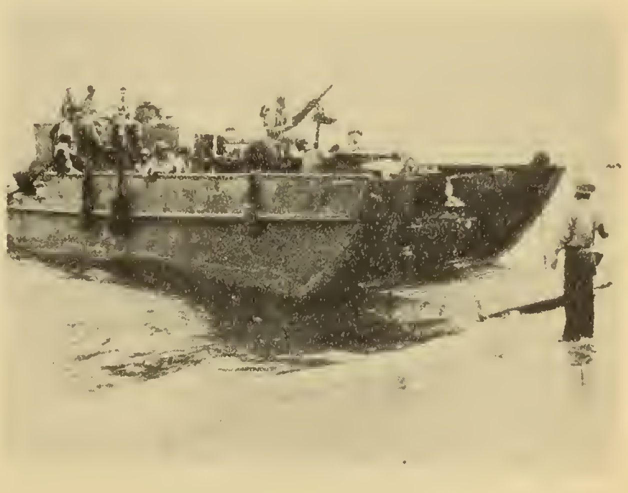
Planning for an amphibious operation is a long, complicated, and extremely detailed process, which must begin many months before D-day. In a landing of considerable size, either the Joint Chiefs of Staff or the Theater Commander issues a directive to the Commander Joint Expeditionary Force setting forth in broad terms the objective area, the limiting dates for the execution of the landing, and the ships and troops available for the task.

Immediately upon receipt of this directive, the Commander Joint Expeditionary Force commences a study of the operation — particularly of the enemy situation at the objective area — makes his estimate of the situation and issues his preliminary planning or warning orders to his senior subordinate naval, air, and troop commanders. This order is considerably more detailed than was the original directive in that it sets forth D-day as a date and designates the exact beaches over which the landing is to take place. From this point on, planning is concurrent, continuous, and coordinated among the Services.

In an amphibious operation, the attacker always enjoys the privilege of selecting the terrain over which he will fight initially; that is, he may pick the beach or beaches that he thinks the enemy is least likely to be defending in force, and that will offer route of egress inland and support the material he wants to bring ashore. In planning, decisions on such a matter as the selection of beaches are based upon the most thorough, accurate, and timely knowledge of the enemy situation and terrain that it is possible to obtain.

Intelligence agencies are very active during this phase. Reconnaissance aircraft, submarines, and scouts are ceaselessly and secretly snipping away at the curtain the enemy has thrown around his shores. With each new item of intelligence, the details thus far planned may be altered or decisions may be confirmed.

All large-unit commanders soon receive orders from their seniors and commence their planning. Minor revisions of the plans are often continued until the actual moment of the landing. When all echelons have received the initial order from their immediate senior and have completed the last-minute details of training and filling of equipment shortages, the time is at hand for the concentration of troop shipping at the ports of embarkation.



LANDING ON GUADALCANAL

A landing boat drops its ramp on the beach at Guadalcanal and a Marine reconnaissance car moves out to take its place in the battle.

LCI HITS THE BEACH
Stretcher bearers wade ashore from an LCI. Speedy evacuation of casualties featured every amphibious landing.

Concentration at Ports. In a major amphibious operation, many of the troops employed may be dispersed over vast areas. They must be assembled in various ports and loaded aboard ocean-going vessels that are located at widely separated points. Due to the extremely accurate and detailed plans formulated and promulgated during the earlier phases of the operation, the designated ships arrive at the appointed times in the prearranged ports. Meanwhile, the troops, together with their vehicles, supplies, and equipment, have assembled in bivouac areas near the ports and are ready to embark on short notice.

Final conferences are held between the opposite troop, air, and naval commanders in the port of embarkation; urgent repairs are made; provisions, fuel, and miscellaneous supplies are procured; and loading and embarkation commence. Considering the magnitude of the task, complete control is obviously essential to maintain a minimum of confusion. Traffic ashore and in the harbor must be rigidly controlled and coordinated; working parties in the ships and on the dockside or beaches must be closely supervised and worked on a 24-hour basis to provide maximum use of berthing facilities by many ships; each available pier, landing, and beach must be used to enable as many as possible of the various ships in the convoy to load simultaneously.

Loading of Transports

The usual procedure followed in loading a ship is for the transport quartermaster to come ashore to assist in the planning several days before the ship commences loading. The plans resulting from the joint conference between the ship's representative and a member of the troop unit to be embarked include provisions for putting each item aboard in inverse order to the priority in which it is desired on the hostile beach. Each landing force commander establishes a system of priorities for every item to be loaded on board his ship. The loading plan having been approved both by the troop commander to be embarked and by the captain of the ship, the vessel makes all preparations to follow this written plan. All boats are lowered in the water, hatches are opened, appropriate cargo-handling and securing gear are put into proper places, and booms are rigged out in the manner necessary to handle the impedimenta of war to be stowed in each hold. As soon as the ship is moored, it is prepared in all respects for loading. The advance party of troops comes aboard immediately and proceeds with the details of loading the ship according to plan and of preparing the ship for embarkation. As soon as all cargo is aboard, the remainder of the troops embark, and the ship relinquishes her berth to another which will follow the same process. In very crowded ports with few facilities, loading may be accomplished when the ship is at anchor. The procedure is similar to that already outlined except that it includes the moving of everything from the beach to the ship by boats. The first ships to load proceed to an anchorage and await the forming of the convoy. Then, on the appointed day, all the ships having been secured for sea, the convoy, with its protective screen of escort vessels, sorties for the objective area. This same action may occur in other ports throughout the area.

Rehearsals

During the latter phases of the past war, the schedule for an amphibious operation always allowed for a rehearsal exercise, as realistic as possible, on some friendly beach that closely resembled the objective area. The object of this "dry-run" was to pre-test the carefully prepared plans for the impending operation and to make final adjustments, if necessary. The ships would proceed from their several ports of embarkation to the rehearsal area and actually go through several landing exercises that were frequently accompanied by live naval gunfire and air strikes. In a few instances, ships were unloaded completely and then reloaded at anchor. Vehicles, guns, equipment, and supplies were ferried both ways in the ships' landing craft. These rehearsals, however, were well worthwhile as the tactical and logistical difficulties thus resolved were frequently the keys to victory in the operation.

After the rehearsals, convoys form up for movement to the objective. At this time, in addition to the escort vessels, there is a fighting task force close by to assist in repelling any attack which the enemy might launch against the loaded transports.

Pre-landing Operations

During all the phases of the operation thus far outlined — planning, loading, and rehearsal — the remainder of the fleet has also been active. The strategic bombers of the Air Force may have started months before to soften up the target area. Carrier air strikes and bombers of the tactical air command have been destroying the power and weakening the will of the enemy to fight in the objective area. The advance force has been conducting air and naval gunfire strikes against coastal targets of the objective area.

On a specified date, generally less than a week from D-day, minesweepers lead the battleships and cruisers with their escorts into the objective area and the preliminary naval bombardment commences. The heavy guns of the fire support ships, aided by air, electronic, and surface spotters, then initiate the deliberate destruction of all known or discovered targets within range.

The final hydrographic reconnaissance and destruction of obstacles to seaward of the beach is also accomplished during these days by the underwater demolition teams, who swim in to the beach under cover of naval bombardment. The last-minute reports of the beach and approach conditions thus obtained are flashed to the troops for appropriate action or any changes deemed necessary. In the event mines or obstacles, man-made or natural, are discovered, subsequent sorties by the underwater demolition team members with demolition equipment will be made, and the obstructions will be removed.

Pre-landing Operations of Wide Scope. All these preparations, of course, are not limited to one or two beaches or, for that matter, to all the beaches on which the landing will be made. The disclosure of our exact landing sites at this time may prove disastrous, as the enemy would have time to concentrate great numbers of mobile reserve just far enough inland to be out of range of the naval guns, and sufficiently well concealed to avoid detection from the air. Many beaches along the enemy's entire coastline may receive this same treatment, just as some of his cities and railroads beyond our zone of prospective operations may be bombed.

Movement to the Objective Area

Thus far the only ships present in the objective area have been the fire support ships, the minesweepers, small survey vessels, or fast destroyer-type transports with the underwater demolition teams, and possibly rocket support ships. Some time during the night preceding D-day, the Joint Expeditionary Force Commander sends the message to his force: EXECUTE PREFERRED PLAN AT HOW HOUR DOG DAY. At this signal, the troopships start in on their last leg of the journey to their assigned areas. These vessels usually come by separate convoys following different routes from the rehearsal area due to the differences in speed characteristics between the large and relatively fast transports and the slow landing ships and craft. During this movement, elaborate precautions are observed to protect the convoys from enemy air, surface, and subsurface attacks. Ship drills are held night and day, and all personnel are assigned battle stations in anticipation of possible enemy attack. Officers and enlisted men are carefully briefed in preparation for the impending operation, and final intelligence information concerning the enemy is incorporated into the plan of attack. By dawn on D-day, all the convoys so scheduled have arrived in the target area and are proceeding to their assigned anchorages.

FIGHTING FACES
Marines present a study in facial expressions of fighting men just before the battle starts. The inevitable card game goes on among the battle-seasoned fighters.

DOWN THE NET
In camouflage suits, with full packs and weapons the Marines lower themselves down the cargo nets into landing craft that will take them into the beach.

Landing Operations

Long before dawn, activity increases everywhere. Troops aboard ship enjoy their last hot breakfast for a long time; the battleships, cruisers, destroyers, and rocket-launching vessels increase their tempo of bombardment; and the carrier aircraft warm up on windswept flight decks, far beyond the horizon. Planes (normally Marine squadrons specially trained for close air support work) are already airborne; they roar in over the beaches and supplement the fire of the naval guns with aircraft rockets, bombs, and strafing. These operations must be closely timed to avoid damage to friendly aircraft by the firing ships.

Diversionary Landings. Concurrently, on other possible landing beaches, the same type of operations are taking place, complete with transports. The troops embarked (generally reserve units of the actual landing force) may even go so far as to disembark into the boats and go through a ship-to-shore feint movement. Such a mock operation tends to confuse the enemy and divide his forces. Other deceptions might include an airborne feint consisting of several large transport planes which drop many parachutes over a remote, though possible, drop zone — yet to each parachute is attached only a sandbag or dummy man. Subsidiary airborne operations might also be conducted in conjunction with a major amphibious operation to seize vital centers behind the beachhead and to prevent the enemy's movement of reserves, or to prevent the destruction of bridges or other installations necessary for accomplishment of the mission of the landing force.

Ship-to-Shore Movement. Sometime before H-hour, the transports reach their designated anchorage areas and on signal commence lowering their landing craft into the water. These craft then circle in prearranged areas and are called alongside transports to receive their cargoes of men and material.

The ship-to-shore movement consists of the deployment of landing craft, first into columns, and then into lines or waves, to permit maximum use of the individual weapons of the landing craft and minimum susceptibility to enemy fire. All these operations are closely timed and controlled. If the beach conditions require, the landing may be made in amphibian tractors instead of in boats, as the former can negotiate reefs and certain other obstacles much more effectively. The troops will normally be launched in their amphibian tractors directly from the holds of LST's or LSD's.

As the waves form at the designated control vessels (generally patrol craft that have additional radio equipment installed) and commence their final approach to the beach, bombardment reaches its peak of intensity. Rocket ships precede the boat waves toward the beach and literally blanket the beach and areas inland with high explosives. Armored amphibian tractors may also be ahead of the first waves to support the troops ashore before any heavier armor is available. As the landing craft and vehicles proceed toward the beach, the naval gunfire is lifted at a predetermined time from the beach areas to inland targets. Presently the initial wave beaches, the ramps go down, and the troops quickly debark, disperse, and make their way inland.

At brief intervals, succeeding waves land with supporting troops and equipment. The landing craft or vehicles, upon completion of unloading, return to their ships to bring ashore the additional troops and vital supplies. The naval gunfire and air strikes continue in accordance with a prearranged plan, until the naval gunfire and air officers attached to the landing force get established ashore and can call their fires on any targets that may present themselves.

Consolidation of Beachhead

When the beachhead is enlarged sufficiently to permit supplies to be landed, the logistical elements which have been ashore since shortly after H-hour preparing the beach for this purpose commence calling in the types and amounts of equipment and supplies that are most vitally needed. As the operation progresses further, they call in the larger landing ships which contain troop reinforcements and the heavier equipment and vehicles. In a short time, the shore party (as the troop element is known) and beach party (the naval component responsible for the functions to seaward of the beach) have established a well-organized, completely controlled system of supplying the troops ashore. As soon as the situation ashore permits, all vessels are unloaded. The engineers, both naval and troop, perform the construction tasks which transform a once desolate beach into a port with all necessary facilities. Operations ashore, as soon as they can be adequately supported with the material subsequently landed, continue inland. Campaigns in which most of the fighting occurs along the coastline are capable of being supported by naval gunfire or carrier aviation. In such a case, this supporting fire is directed by the appropriate officers attached to landing force units. Once airfields are constructed ashore and improved sufficiently to support the necessary aircraft, the carriers turn to more lucrative, strategic, or tactical targets beyond the range of shore-based planes.

Conclusion

The landing of forces on a hostile shore against enemy resistance is the most difficult of all wartime operations. Amphibious operations, due to their extremely complex and specialized nature, call for exact and detailed planning and for the coordination of a great many factors and components. No other type of operation requires such careful training, or such a high degree of initiative, tenacity, and teamwork on the part of all Services.

It would be well to remember that the amphibious operation was the "springboard" from which the Armed Forces of the United States launched every major invasion of enemy lands during World War II, and that any future war involving this country will again see this type of warfare playing a vital role.

CHAPTER 21

LOGISTICS

LOGISTICS PRIOR TO WORLD WAR II

Differences and Definitions: Logistics, Strategy, and Tactics

Because World War I and especially World War II approached what we might term total war — war in which a country's entire economy had to be marshalled for victory — they were different from all other wars. The emphasis on logistics made them unique. The human race, to be sure, had what it thought was considerable experience with war during more than 3,000 years of fighting in some 34 centuries and in about 8,000 recorded wars. But the problems facing Napoleon and General Pershing, to take two examples in more recent years, were so unlike not merely in complexity but also in nature that they need analysis to enable us to evaluate what we have done and what conceivably we may be faced to do in the future.

Napoleon thought in terms of strategy and tactics. He never had to think in terms of logistics as Pershing did. Napoleon could say simply, "An army marches on its stomach," a remark frequently quoted. He meant simply that well-fed soldiers win campaigns. Pershing had to think as much in terms of logistics as in terms of strategy and tactics. His soldiers needed food, of course, but they needed more than just food to enable them to defeat the Central Powers. And later in World War II each soldier overseas had to be given twelve tons of food and equipment at the start and another ton a month to keep going, to enable America to defeat the enemy.

Let us try to define briefly the words strategy, tactics, and logistics, terms which will come up from time to time. *Strategy* is concerned with the general plan for the employment of a nation's fighting forces. *Tactics* refers to specific maneuvers and special techniques of fighting. Tactics is a narrower term than strategy and deals mainly with the mechanics for the execution of the strategic plan. Tactical victories, no matter how inexpensive and brilliant they may be, may count for little unless they fit into the pattern of the strategy involved.

Logistics, a word never used by Napoleon and generally employed only as late World War II, refers to the total process by which the resources of a nation — material and human — are mobilized and directed toward the accomplishment of military ends. Thus, while strategy provides the scheme for the conduct of military operations, logistics provides the means therefor. One writer recently claimed that logistics "forms the basis on which rests the whole structure of war; it is the very foundation of tactics and strategy."

The emphasis on the mobilization of all forces slanted toward a definite military goal is the new note. No more can strategists dealing with only the disposition of Navy and Army units be counted on to win wars; still less can tacticians by means of a brilliantly executed single battle. Logistics, strategy, and tactics are now interdependent. It is impossible to think in terms of one without giving proper weight to the other two. One may say without danger of overemphasis that only a nation possessing abundant material resources and with men and women capable of the most efficiently streamlined superhuman effort and furnished with a master plan logistically conceived can win a war in the present era.

It is difficult to find a better definition of logistics than that given by Secretary of Defense Forrestal in his annual report submitted in 1944 when he was Secretary of the Navy:

> Logistics is the process of providing what is needed when it is needed where it is needed. It embraces the supply and distribution of men and materials. It involves forecasting requirements. It is the scheduling, production, assembly, storage, distribution, maintenance, repair, and replenishment of equipment. It is the procurement, training, billeting, feeding, distribution, staging, hospitalization, replenishment, and the rehabilitation of personnel.

Many of the erroneous concepts of logistics may have arisen from the fact that before World War II when the nature of logistics was imperfectly understood and envisaged, military writers used the term more or less interchangeably with the terms *communications* and *supply*. Although Mahan was a penetrating writer about naval strategy, he too instead of employing the word *logistics* (which appeared only once in his books) used as inexact synonyms the words *communications* and *supply*.

While it is true that the measure of success in modern war depends on the degree of coordination among Army, Navy, and Air Forces and that this success is finally dependent upon supply, nevertheless the word *supply* suggests too little the emphasis placed upon the organization of industry. In a country founded on free enterprise like the United States, industry must be reorganized quickly and drastically in time of war to insure smooth and abundant production for both civilian and military life.

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'THE RIGHT THINGS—AT THE RIGHT PLACE—AT THE RIGHT TIME
There are many steps between producer and consumer when war is waged thousands of miles from a nation's sources of supply but through the science of logistics the items arrive when and where they are needed.

With the expansion of modern warfare both in area and complexity, logistics has become one of the most vital problems faced by a nation in war. General George Marshall, in his Biennial Report as Chief of Staff in 1943, said, "The requirements of logistics are seldom understood. The burdens they impose on the responsible military authorities are rarely appreciated." Unfortunately, as he says in his final report, the handling of such matters is "only vaguely appreciated by the public or even the rank and file of the armed forces." During the recent war, Admiral Ernest King stated, "The war has been variously termed a war of production and a war of machines. Whatever it is, so far as the United States is concerned, it is a war of logistics."

Logistics in the 18th Century

The significance of 18th-century logistics may be thrown into proper focus if we contrast the sailing vessels of that era with the ironclad and steam-propelled warships of the 19th century. Surprisingly enough, sailing ships were far more self-reliant than ships dependent on coal. Food could be stocked for six months and enough fresh water for three months. Wooden hulls could go several years without cleaning, but iron hulls fouled rapidly and had to be scraped and painted at least once a year. Sailing vessels needed only wind for propulsion; iron ships needed water for steam and coal for fire. Sailing vessels could manage with far fewer hands than iron ships, and larger crews required more living space and more food and equipment. The greater fire power of modern guns raised the problem of storage space for ammunition and replenishment of ammunition that was expended more rapidly. Steam engines must always be thought of in terms of maintenance which involves supplying spare parts and machinery repairs and experts to do the work.

The naval revolution which began fully to be resolved in the 1880's shows how much more complicated logistics was in the 19th century than in the 18th century. The warships of the new Navy lost the few qualities of self-reliance which the old Navy of sailing ships had.

The nature of the revolution impressed Mahan and he gave it considerable space in his writings. He thought about it logistically as can be seen by his comments though he did not use the word. Mahan was impressed with the number of British bases on the Atlantic and in the Caribbean and gravely concerned about our lack of such bases. He pointed out that on the Gulf of Mexico we had not "even the beginning of a navy yard which could serve as the base of our operations." He took the position that no European nation should be allowed to acquire a coaling station within 3,000 miles of San Francisco. "For fuel is the life of modern war," he wrote cogently. "It is the food of the ship; without it the modern monsters of the deep die of inanition." He was also gravely concerned to see the Americans so eager to acquire fast ships while ignoring the means whereby they should be supplied with coal. Because the United States had then no foreign establishments either colonial or military, new American warships were, as Mahan picturesquely but truly put it, "like land birds, unable to fly from their own shores."

Mahan's important book, *The Influence of Sea Power upon History, 1660-1783*, published in 1890, has as its central thesis this thought: The United States if it is to survive as a nation must have naval bases as links between the now dependent warships and the strategic command of the sea. The curious contradiction which Mahan pointed out so ably was that the command of the sea by modern warships demanded external sources of support if they were to retain the seakeeping ability which the technical revolution was taking from them.

Yet it does not do to oversimplify the role of logistics in naval warfare even in the 18th century. In Nelson's pursuit of the French admiral Villeneuve across the Atlantic and back, Nelson maintained his forces in fighting condition and was never embarrassed about stores because he was always forehanded.

In contrast to Nelson, Admiral Suffren of the French fleet, though he had forces superior to the British and though he was skillful as a commanding officer, found himself at a disadvantage. Originally he had positions in India as advantageously situated as the British, but the French lacked the logistic skill to draw from them the resources necessary to maintain a fighting fleet. And so it came about that the world spoke of "British India" but not "French India."

Logistics in Napoleon's Russian Campaign

Some writers have referred to Napoleon's defeat in his Russian campaign as a "logistical defeat." Napoleon failed in his logistical planning in that he thought in terms of Central European roads instead of Russian roads. Bad weather added to his transport problems. A combination of circumstances that struck at the logistical aspects of his campaign brought about his defeat — badly designed transport, improper forage, insufficient supplies, inadequate protection against the cold — these played a major part in Napoleon's most disastrous failure.

As a matter of fact plenty of food or sources of food were provided but through maladministration by responsible personnel and faulty functioning of the transportation system more was wasted than was eaten. Another factor was the harassing and delaying policy of the Russians who kept retreating ever deeper into their country, knowing that prolonging the war would mean dwindling supplies for their adversaries who were fighting far from their main sources of supplies.

Napoleon's Russian campaign presents an excellent example of the importance of logistics as a contributing factor — possibly even a decisive factor — in the attainment of final victory.

Logistics in the Franco-Prussian War

The Germans overwhelmed the French in the Franco-Prussian War because they had a master plan of logistics whereas the French with excitable unpreparedness had none, did the best they could, and learned that war fought with only improvisation is almost certain to result in defeat. In 1868, two years before hostilities broke out, Field Marshall von Moltke presented to his government plans for the strategic concentration of German armies based upon two suppositions, the first that France would fight alone and the second that France would fight with allies.

These two plans had been carefully worked out after many years of study of the economic facts both in Germany and in France, especially in terms of French forces and resources.

It was estimated that within 24 days after the war machine began rolling, the Germans could hit the French on the French border with the full weight of 300,000 men fully equipped with engines of war. It was also estimated that the French could mobilize only 150,000 men with inferior morale and equipment.

During the two years or more of preparation, the Germans with greater efficiency cut down to four days the time necessary to mobilize and strike with full force. With characteristic thoroughness the Germans had solved their logistics problem, and they won the war with a minimum amount of effort and loss.

Logistics in the Spanish-American War

Following the Civil War, the Navy went into a serious decline, and when the Spanish War loomed on the horizon, we were so far from being able to meet it logistically that we had to do serious thinking about the means of maintaining our fleet overseas. Paradoxically, though the Philippines were much farther away from the United States than was Cuba, Dewey's problems of logistics were relatively simple. A few dispatches were sent to Dewey at Hong Kong to fill his bunkers with coal, purchase a supply steamer, and hold himself in readiness for any eventuality. It was not difficult for him under these circumstances to get ready to proceed and attack the enemy when orders came.

It was well for the United States that Dewey's victory at Manila was so complete. If the Spanish fleet had been able to escape to sea and avoid contact for some time, Dewey's position would have been precarious. Facilities in the Philippines for repair were inadequate. His nearest source of coal outside Manila itself was the few thousand tons at Pago Pago and at Hawaii. It was some time before he could expect shipments of coal and, even more important, shipments of ammunition from the United States. Anything less than the spectacularly complete victory he achieved might have raised serious, even fatal, logistics problems.

Because the blockade of Cuba required the maintenance of a naval force constantly at sea there resulted a number of serious logistics problems. There was insufficient coal for the ships. They had to be withdrawn from the blockade to return to port for refueling, which weakened the blockade; or they had to be refueled at sea, which often resulted in damage both to colliers and to warships. Eventually a coaling station was established at Guantanamo, and the fuel difficulties were lessened.

The lack of fresh water was another serious problem. Because of the large demands from vessels constantly under steam, the two distilling ships sent to the West Indies were incapable of producing sufficient fresh water.

Machinery breakdowns, particularly of electrical machinery in torpedo boats, were common. A repair ship, the *Vulcan*, did such useful work that it demonstrated clearly that repair vessels were essential adjuncts of fighting ships.

Commentators, after a study of the Spanish-American War, were agreed that repair ships, distilling ships, colliers, and coaling stations were essential elements of the United States Navy. During the years immediately following the war, there was considerable activity in the development of yards, docks, coaling stations, and other logistic facilities.

The 'round-the-world cruise from 1907 to 1909 of the American fleet consisting of 16 battleships, the Atlantic torpedo flotilla of 6 ships, 2 stores ships, a repair ship, a tender, and the torpedo flotilla parent ship, has been variously described. Mahan professed to see in it merely a practice cruise in what would now be called fleet logistics. He said, "The huge administrative difficulties connected with so distant an expedition of a large body of vessels dependent upon their own resources" should prove of inestimable value. By "own resources," he hastened to add, he meant, "not that which each vessel carries in itself, but self-dependence as distinguished from dependence on any near navy yards . . . the great snare of peace times. The renewal of stores and coal on the voyage is a big problem . . . a problem of combination, and of subsistence; a distinctly military problem. To grapple with such a question is as really practical as is fleet tactics or target practice."

Logistics in World War I

Though World War I hinted at "total war" as it is understood today, though enormous masses of men in motion on various fronts faced one another, and though factories and farms and mines and railroads were engaged, nevertheless for the United States it was not primarily a naval war.

Logistically, the Navy's problem was far easier than the Army's. To maintain its forces overseas the Navy established 15 naval bases and 27 aviation bases and operating stations. Port organizations were set up in 20 European ports. Supplementing these facilities ashore, logistic support was provided to the Operating Forces by repair vessels and tenders at Queenstown, Brest, Gibraltar, Corfu, and other strategic positions.

Logistically speaking, the point is that American naval problems were far simpler than they proved to be in World War II, for American bases in British and French harbors were already well developed. Piers, docks, buildings, and warehouses were already available. Though they frequently required alterations and renovation, the labor and efforts were by no means comparable to what they would have been if we had begun at the beginning to build from the ground up.

Another fact of supreme importance indicating the simplicity of our naval problems in World War I is that with few exceptions only light naval forces were involved. The American battleship division at Scapa Flow, which was the principal exception, enjoyed all the comforts of a well-established British base.

Admiral Sims described the idea of moving the whole North Atlantic fleet to European waters as strategically poor and logistically impossible. "What naval experts call 'logistics' of the situation," he later wrote, "immediately ruled this idea out of consideration. The one fact that made it impossible to base the Fleet in European waters at that time was that we could not have kept it supplied, particularly with oil."

Even for the lighter forces, many heavy repairs were done in the United States. When destroyer boilers needed replacement or retubing, the vessels returned to the United States.

What the Navy accomplished in its shipping effort was tremendous. It required enormous energy to man, husband, and operate the large fleet of cargo vessels.

The role of the Navy in World War I, that of transporter, was logistically different from that of its role in World War II, that of shipper and supplier. As a transporter in World War I, the Navy was responsible only for picking up the cargo at one terminal port and delivering it at another.

The true logistics test of the Navy had yet to come in World War II. In World War I, despite the tre-

KEEP THEM SUPPLIED
Without logistics, all the resources of United States would have been powerless to supply our military forces.

mendous increase in the fleet and in the Naval Establishment the Navy did not operate independently; it worked in terms of European dependency. Though highly successful in World War I, the Navy had not yet begun to think logistically. The Navy continued then to think of the Atlantic Ocean as a friendly lake with shores lined with suitable harbors and havens.

In the spring of 1940 when, upon the completion of spring maneuvers, the entire United States Fleet was ordered to Pearl Harbor, the Navy found itself compelled to deal with a genuine logistic task. As a result, Pearl Harbor with all its failings was immeasurably better prepared in 1941 than it had been in 1940 to maintain a position 2,000 miles from our shores. The United States had taken at least the first of many steps by which we ultimately projected across the enormous areas of the Pacific a naval force capable of taking and maintaining the sea.

LOGISTICS IN WORLD WAR II

Logistics Becomes a Major Problem

Before World War II, naval logistics was a theoretical rather than a practical problem, and logistical support was considered, by a majority of the officers of the Navy, a matter of routine administration. The primary problems normally presented were those involved in fleet concentrations and winter cruises. These were usually of such short duration that ships overseas required only fuel, fresh provisions, and emergency repairs, having stocked to capacity in all other items before leaving home bases. In addition, ships were usually in excellent material condition, having received thorough overhauls at scheduled periods.

World War I had not produced any serious strategical or logistical problems for the United States Navy. It became evident, however, early in World War II that the war would be one that revolved around the physical means available for prosecuting it; that the logistics aspects would be an important factor in determining the strategy to be followed. This is evidenced by the early decision taken in Washington to concentrate on the Germans first with the force we could make available, holding the Japanese at arm's length, so to speak, while pressing the war against the Germans. The ships, tanks, and planes then in existence were insufficient to prosecute an all-out offensive on both fronts.

Logistics the Basis of Modern War

In World War II problems of production of munitions in our factories and their transportation and distribution to the Armed Forces were gigantic. The logistics problems of World War II were of such magnitude that the logistics planning and the implementation of plans involved not only the service personnel particularly trained in that branch of the military art but also area and tactical commanders, port authorities, railway, truck line and air line executives, warehousemen, longshoremen, manufacturers, and on down through the entire working population of the United States. Indeed the war affected every man, woman, and child in some way.

How logistics forms the basis for modern war, how logistics determines the nature of modern strategy and tactics may be seen by a glance at some of the wartime problems involved in the Atlantic operations against Germany and in the Pacific operations against Japan.

Because the war was fought in Europe, Africa, and Asia, men and equipment had to be shipped or flown over 3,000 miles across one ocean and over 7,000 miles across the other. Though the campaigns in Africa, Europe, and Russia seemed enormous, they were small in comparison with the war in the Pacific which ultimately extended over 64,000,000 square miles, an area twice as large as the United States.

The overseas communications of the United Nations in World War II covered the globe and extended 56,000 miles. The Naval Air Transport Service flew routes stretching over 80,000 miles. The Navy maintained a network of more than 700 depots and stations in which were kept stocks of over 4,000,000 kinds of items.

Narrowing the consideration to bring the matter into sharper focus, one discovers that the stocks on hand at Guam alone would have filled a train 120 miles long. In just one month more than 25,000,000 barrels of bulk fuel were shipped to the Pacific for military purposes. At Guam 1,000,000 gallons of aviation gas were used daily; in the area around the Naval Supply Depot on that island were 93 miles of roads. In the Okinawa campaign, 50,000 tons of 5-inch to 16-inch projectiles were fired by surface ships, which meant that a new supply had to be built up for the assault on Japan. Each month 600,000 long tons of military equipment had to be sent out into the Pacific Ocean Areas. And then last but possibly not least is that when the peace came, the 600,000 tons had to be shut off in the face of all sorts of difficulties connected with transportation, storage en route, and labor troubles in the States.

A prominent industrialist recently in a speech dramatized the enormous industrial production requirements in modern war. He said:

"The 1550 U. S. merchant ships sent to the bottom during World War II were capable of carrying in a single trip enough wheat to feed the people of Greece for eight years. Our own armed forces alone used up enough cotton and wool to make 650 million dresses and 160 million suits of clothes — enough steel was used up by the U. S. alone to make 230 million automobiles, one for every man, woman, and child in North and South America. The money spent on tanks alone by the U. S. Army would have paid for 20 million electric refrigerators, 85 million bathtubs, or 140 skyscrapers the size of the Empire State Building in New York. The wire used by our armed forces in communications and electronic equipment alone would have stretched around the world 200 times."

But the matter of logistics is not simply a problem of producing enormous amounts of material and transporting them immense distances; also vital to success in war is the matter of timing. Convenient though it would be to have all the components of a Navy engaged in offensive operations moving at the same speed, a strategist must work with more complicated

NAVAL SUPPLY DEPOT, GUAM

This is the famed Naval Supply Depot at Guam. Speed with which material was shipped here gave rise to the saying, "Here today and Guam tomorrow."

situations. In the Okinawa campaign, for example, 1,400 ships took part, some traveling at 8 or 9 knots, some at 11 or 12, and some at 15. Men had to be trained in four widely separated areas ranging from 1,200 miles to 8,000 miles from the target. All men and all ships had to have both surface cover and air protection overhead with ships coming from a variety of ports and with planes from a variety of airfields. Men, planes, and ships had to be supplied during the weeks of training preparation before the invasion, during the invasion, and after the invasion — and these supplies came from all over the globe. All the ships, planes, and men traveling at such varied speeds over immense distances with different winds, tides, currents, channel and port conditions had to arrive at a definite spot at a definite time. That operation was only one of many that presented a vast problem in logistics to the Navy in World War II.

LOGISTICS PLANNING TODAY

Introduction

It is the feeling that our country in war will always be able to match any opponent in spirit and determination, but our resources and manpower are definitely limited. If we can organize in the most effective way our own resources and those other world resources which we can command through allies and friendship, victory will be ours.

Should total war ever come to us, the whole national economy would have to be mobilized efficiently. Our national economy is very complex. The experiences of two major wars within one generation have demonstrated conclusively that the solutions of these problems cannot be left to wartime improvisation.

In the belief that any future war would require totality of effort and place an even greater strain on our economy than did World War II, the Congress incorporated the lessons of this war into a new organization that recognizes clearly that responsibility for our national security is a matter that now rests on the entire nation and is not confined to the military forces alone.

Provisions of National Security Act of 1947

The legislation known as the National Security Act of 1947 provides for a National Security Council to appraise the resources and commitments of the United States in relation to actual and potential military power. The same act provides for a National Security Resources Board to coordinate military, industrial, and civilian mobilization. Thus the National Security Organization set up by this law includes agencies which in war would discharge the duties performed in World War II by the numerous independent agencies or commissions which were established as emergency measures to solve pressing logistical problems.

LEVELS OF LOGISTICS

Introduction

There are four levels of logistical planning and effort which concern those in the National Security Organization extending from the President of the United States down to naval units in the field. The four levels to be considered are: 1) Government level, 2) National Military Establishment level, 3) Navy Department level and 4) field level. The functions of the first two levels are described in the National Security Act of 1947 and are quoted below.

Government Level

The function of the National Security Resources Board is to advise the President concerning the coordination of military, industrial, and civilian mobilization, including:

Policies concerning industrial and civilian mobilization in order to assure the most effective mobilization and maximum utilization of the nation's manpower in the event of war;

Programs for the effective use in time of war of the nation's natural and industrial resources for military and civilian needs; for the maintenance and stabilization of the civilian economy in time of war, and for the adjustment of such economy to war needs and conditions;

Policies for unifying, in time of war, the activities of federal agencies and departments engaged in or concerned with production, procurement, distribution or transportation of military or civilian supplies, materials and products;

The relationship between potential supplies of, and potential requirements for, manpower, resources, and productive facilities in time of war;

Policies for establishing adequate reserves of strategic and critical material, and for the conservation of these reserves;

The strategic location of industries, services, government, and economic activities, the continuous operation of which is essential to the nation's security.

National Military Establishment Level

The National Security Act of 1947 established in the National Military Establishment a Munitions Board. It shall be the duty of the Board under the direction of the Secretary of Defense and in support of strategic and logistic plans prepared by the Joint Chiefs of Staff:

LOGISTICS—LIFELINE OF THE FLEET
Logistics refers to the total process by which the resources of a nation are mobilized and directed toward the accomplishment of military ends.

To coordinate the appropriate activities within the National Military Establishment with regard to industrial matters, including the procurement, and distribution plans of the departments and agencies comprising the Establishment;

To plan for the military aspects of industrial mobilization;

To recommend assignment of procurement responsibilities among the several military services and to plan for standardization of specifications and for the greatest practicable allocation of purchase authority of technical equipment and common use items on the basis of single procurement;

To prepare estimates of potential production, procurement, and personnel for use in evaluation of the logistic feasibility of strategic operations;

To determine relative priorities of the various segments of the military procurement programs;

To supervise such subordinate agencies as are or may be created to consider the subjects falling within the scope of the Board's responsibilities;

To make recommendations to regroup, combine, or dissolve existing interservice agencies operating in the field of procurement, production, and distribution in such manner as to promote efficiency and economy;

To maintain liaison with other departments and agencies for the proper correlation of military requirements with the civilian economy, particularly in regard to the procurement or disposition of strategic and critical material, and to make recommendations as to the policies in connection therewith;

To assemble and review material and personnel requirements presented by the Joint Chiefs of Staff and those presented by the production, procurement, and distribution agencies assigned to meet military needs, and to make recommendations thereon to the Secretary of Defense; and

To perform such other duties as the Secretary of Defense may direct.

Joint Chiefs of Staff. On the National Military Establishment level, the Joint Chiefs of Staff prepare strategic plans and joint logistic plans necessary to support their strategic plans. They then assign to the military services logistic responsibilities in accordance with such plans. Another duty is to review major material and personnel requirements of the military forces, in accordance with strategic and logistic plans.

Navy Department Level

Logistics administration and control at the Navy Department level involves two distinct relationships: that of planning, forecasting, prescribing and distributing the requirements of the Operating Forces—the logistics of consumption; and that of developing, procuring and producing the material and personnel required to meet the needs of the Operating Forces — the logistics of production.

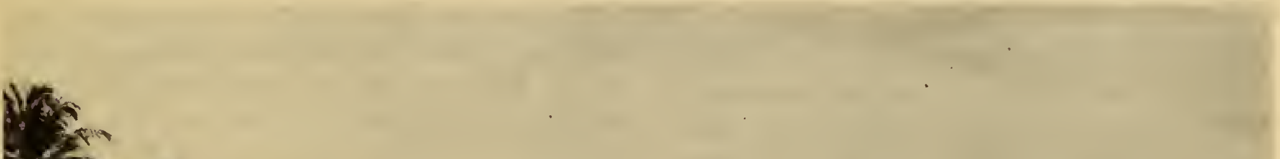
The line of demarcation between consumer and producer logistics cannot readily be fixed and defined due to the fact that the two functions are interrelated and represent a continuous "cause and effect" relationship which cannot be severed. The administration of the two functions, however, is divided in order to assure the best-qualified supervision of each function.

The determination of the "what, when, and where," that is, consumer logistics, is a military function and as such is assigned to the Chief of Naval Operations and his subordinate field commanders for administration and execution. Producer logistics is a business function and therefore is assigned for administration and execution to the Secretary of the Navy and the material bureaus of the Navy Department.

Field Level

The field level is generally considered to include everything outside the Headquarters of the Navy Department. Logistics on the field level is primarily concerned with determination of requirements for normal maintenance of the fleet and bases, for special operations, and with the orderly and timely distribution of materials to fulfill these requirements. There are several echelons on the field level beginning with the theater commander and including transportation and supply activities throughout the United States and in the forward areas. In addition to the normal logistic administration each tactical operation requires the provision of special personnel and material at exact times and places. A major portion of the detailed planning for each operation is done on the field level as are all actual assembly and transportation of men and material.

Theater Logistic Plans. The theater commander must analyze the strategic, tactical, and logistic plans of the Navy Department, advise his superiors of the logistic resources which are allocated to him. He must match up what he is told to do with the tools that he is given to work with and organize his operations so that everyone concerned not only has the proper implements available, but also is assured of replenishment and replacement at the proper time and at the proper place. Consideration must be given to supply, transportation, repair, and maintenance of ships and



UNLOADING SUPPLIES
Heaped-up barges and small boats bring in food and ammunition for American fighting men.

equipment, medical attention, and all of the other elements that are required to enable men to fight. Fuel oil, meat, beans, and bullets must be constantly available to those who need them, mail should be delivered as often as possible, and provision should be made for assisting ships which may have been damaged by the enemy. All these and other logistic matters comprise the logistic plan.

OTHER ASPECTS OF LOGISTICS

Phases of Logistics

From the over-all point of view, logistics must be considered in three phases: a statement of what is required, when, and where; the procurement of what is needed; and distribution. The first of these, the statement of requirements, is a military responsibility; the second, procurement, is a commercial matter; the third, distribution, is again primarily military in character as it involves the assembly, transportation, handling in the field, until the ultimate consumer — the enemy — feels it in combat. The success of military operations depends upon the speed and precision with which these tasks are accomplished.

Planning and Material Control

Concurrent Planning. Time is required to fabricate trucks, ships, airplanes and all the other materials of war, but some can be made more quickly than others. The "lead" time on trucks is relatively short but on ships is relatively long. This simple fact necessitates that planning on all levels be done concurrently so there will be no slip-up in having the right things at the right time in the right place.

Requisites for Control. An efficient and well-balanced organization is necessary to control the stream of supplies to the Armed Forces. The Navy Department developed many techniques and short cuts for control during World War II. Among these was the standardization of organized units for advanced bases and the drawing up of a sort of Sears Roebuck Catalog describing them. It was known as the *Functional Component Catalog* and from it the theater commander could order a unit, with men and all the tools, for ship repair, communications, hospitalization, and so on. Other techniques were inventory and shipping control systems by which a control office could know where the main units were that were destined for specified advanced bases or for the fleet at sea.

The long time required for manufacture imposes on naval operations a relatively long and fixed schedule for supply, while the constantly changing situations in war impose on the area commanders a short and fluctuating time table in which to state their needs. It is therefore apparent that procurement cannot wait until the area commanders say exactly what they are going to need. Without carefully planned long-range programs, providing not only adequate reservoirs of supply but flexible pipelines of distribution, it would be impossible to meet the requirements of combat.

Distribution

Fleet Supply. The resupply of the vessels of the fleet was developed into a fine art. Special groups of service ships were made up consisting of ships carrying food, aircraft, ammunition, and fuel. These groups of ships, protected from submarines by their own destroyers, were stationed at sea near where our fast carrier task forces were operating but far enough from enemy air bases to be safe from air attack. As the carrier task forces needed supplies the various ships of the force obtained from the service squadrons — *at sea* — what was needed. So efficient was this method of supply that one task unit remained at sea making repeated attacks on the enemy for a period of nearly three months.

Assault Operations. The supply and transportation of the men and materials for a major offensive such as Normandy or Okinawa present a tremendous problem. The simple delivery of colossal quantities of men and materials required to be laid down on the beaches had to be most carefully planned with almost split-second timing in perfect waves. There is no value in a truck without gasoline nor in a construction battalion without bulldozers. All of this requires planning with infinite attention to detail.

SUMMARY

The naval logistics organization is coordinated with the national economy through the National Security Resources Board and with the other two fighting services through the Joint Chiefs of Staff and the Munitions Board.

Logistical requirements are determined from the combat tasks assigned tactical commanders who must be provided with sufficient men and material to perform his task. Logistical responsibility canot be separated from command responsibility.

The process of providing efficient logistical support to the Operating Forces consists of three phases: statement of requirements, procurement, and distribution. In peacetime, the logistics problem involves only the field level and the Navy Department but, as international conditions deteriorate, the responsibility for the logistic process broadens, first, to the National Military Establishment level and then, as all-out war approaches, to the government level.

The efficiency of logistic performance has been the determining factor in shaping the history of the nations of the world. It is now, during peace, that our logistics organization at all four levels must be perfected so that in a future emergency our national resources of men and material will be used efficiently and effectively.

CHAPTER 22

NAVAL COMMUNICATIONS

INTRODUCTION

Importance of Communications

If World War III should come to pass, communications might well be the primary target of the atomic bomb.

Some military analysts believe that an enemy with atomic bombs would try to knock out our industrial cities. Such tactics, if successful, would certainly curtail and might possibly paralyze production. Others believe that an enemy might concentrate on our railroad terminals and thus cripple transportation, slow down industrial production, and starve the people.

Radio Washington — that would probably be the target if an enemy had only one atomic bomb, for Radio Washington is the heart of Navy communications. If an enemy had only five bombs in all, it might well drop the other four on San Francisco, Balboa, Honolulu, and Guam, the arteries of naval communications through which blood is pumped by the heart Washington.

Without the ability to communicate, our ships and planes would be as vulnerable as toy sailboats on a frogpond or as paper kites over a playground. For without a master plan which includes any number of minor plans, the details of which must be sent to fighting units, victory would be virtually impossible. Communications enables a nation to look in on nearly every part of the world and to hear nearly everything of importance being said. Using such information, communications can formulate intelligent offensive warfare. Communications gives our best minds on land and sea full opportunities to scrutinize enemy action and to decide what we should do about defense and attack.

Communications must work fast. When fighting, we must know within seconds, even split seconds, new developments in strategy, for future warfare may make World War II seem like a sports film run off in slow motion.

The Navy sees clearly that the nation with the best communications has tactical advantages that can spell the difference between defeat and victory. In times of peace, junior line officers as part of their general indoctrination get at least six months of concentrated communications duty during their first two years at sea. In times of war, they must forego this experience and work in whatever special sort of duty the Navy considers them best qualified.

Every line officer must have a working knowledge of the *General Signal Book* and with the Joint Army-Navy-Air Procedure (JANAP) series. When a ship is underway in formation, the *General Signal Book* is in almost constant use on the bridge, and the officer of the deck must be familiar with its contents.

Voice and Ears of the Navy

Communications may be called the ears of the Navy with hearing so perfect that they can detect a submarine drifting far below the surface of the ocean a half-mile away. Communications may be called the eyes of the Navy with vision so perfect that they can detect enemy planes flying 10,000 feet above a ship in a dense fog. Communications tells the gunners, the fists of the Navy, where and how to punch into oblivion the planes and ships of the enemy.

These operations sound simple. Actually the techniques and the machines involved in such ear phones

AWAITING ORDERS
Marines stand by with radiotelephone sets waiting for orders on the next move against the enemy.

and eye lenses are complicated and magical. Shout and you may not be heard a foot away. Whisper and it will carry 10,000 miles. Adjust your eyes to the PPI (plan position indicator) and you can see every ship in the enemy fleet and every plane in your own, waiting for the word to strike. If you know how to see, infinitesimal changes in pips mean the difference between window (thin strips of aluminum floating in the air, devices used by the enemy to deceive) or corner reflections from a small balloon and enemy aircraft with machine guns in the nose and bombs in the bomb bay. Communications make the difference between throwing a wall of fire into the air and bringing down a cloud of kamikazes or a cloud of vapor.

The semaphore and the masthead blinker are no longer powerful or delicate enough to do the job of sending the messages necessary for results in global warfare. Today, oral, visual, and written messages must go around and across the world. And so the Navy needs landwire and cable devices; radio, sonic, and supersonic devices; radioteletype, radiotelegraph, radiotelephone, and radiotelephoto.

Officers and men must know not merely how to operate these machines but also when. They must adapt themselves to the critical moment when one kind gets knocked out and another must be substituted. Modern warfare must reckon in terms of inches on a beachhead and in terms of continents and oceans in global and totalitarian conflicts. Machines that were good enough last month to hear and see the enemy before they could see us may now be obsolete because of the enemy's progress in developing machines telling them what we are saying and doing.

HISTORY OF NAVAL COMMUNICATIONS

From the Revolution to the Civil War

A President of the United States today may sit at a desk in Washington and speak to the entire nation, but as late as 1775 lanterns were placed in the Old North Church in Boston—"one if by land and two if by sea"—to send Paul Revere on his way to tell the farmers what the British were doing.

So primitive were methods of communication during the Revolutionary War that we find this order by a naval commander to merchant ships in a convoy: "Should anyone of the fleet discover a strange sail, he will hoist a Lanthorn in the best place to be seen and fire a gun, if he has one."

The tradition in the times of the Revolutionary War was that you should sight your enemy ship, sail toward him, fire at him, cripple him, and perhaps board him. Consequently a British admiral could send this message to a British captain: "Now, my dear Kempy, do, for God's sake, do, my dear Kempy, oblige me by throwing your signals overboard and make that which we all understand: *Bring the enemy to close order action.*"

But with Thirteen Colonies involved in a rebellion against England, and with colonial privateers joining other vessels to form a Continental Navy, some sort of communications had to be evolved. And so the Continental Marine Committee in 1778 issued to the "Fleet" their first directives consisting of simple maneuver and recognition signals.

Most men when fighting a war want to know what their side is doing and what the enemy's activities are. In the old days because of antiquated communications, they were generally forced to guess and without much chance of guessing correctly. When England was fighting France in 1798, the Toulon fleet slipped through the British blockading squadron. Though discovered and followed by two British observation frigates, the first news Nelson received about the escape came eight weeks later. For 30 days he scoured the Mediterranean trying to find them; in the meantime the French had put back again into Toulon.

It was easier to communicate on land, and during the French Revolution the Chappe Semaphore or "telegraph" was invented by a young Frenchman named Claude Chappe. Messages were sent letter by letter from stations five or ten miles apart. The instrument consisted of a 15-foot cross arm on top of a tall pole with shorter rotatable arms at each end of the cross bar. The longest French system, Paris to Toulon, was 470 miles and comprised 120 stations. The Russians had an extended semaphore system from the Prussian border to Moscow to St. Petersburg, 1,200 miles, with 220 signal towers, and manned by 1,300 operators.

Americans used the same technique for informing maritime circles about the arrivals of important clipper ships. Lines were constructed from Cape Cod to Boston and from Coney Island to New York City. San Francisco's Telegraph Hills gets its name from such a system once located there.

Captain Thomas Truxtun in 1797 worked out 287 day signals but only one night signal, and that was "Attack the enemy!" The principles underlying his system printed as an official *Naval Signal Book* in 1800 are those of the present system.

The system was based on ten numeral flags, 1 to 0. Orders were signaled by numbers and various combinations of numbers, which were assigned certain meanings to be looked up in a decode similar to the present systems.

During and After the Civil War

The Civil War presented some new problems in communications. Many northern officers joined the South, and consequently northern signals had to be completely revised. The Bureau of Navigation, which took charge of Naval Communications in 1862, decided that the Navy should adopt the Army system of signals. As a result the Myers Code was included in the curriculum at the Naval Academy. The Army proved so superior to the Navy in communications that it dominated Navy signaling until as late as 1892.

Semaphore came into the Navy in 1861 with a book entitled *Code of the Flotilla and Boat Squadron Signals for the U. S. Navy,* which contains illustrations of a homograph, a hand semaphoric system similar in many ways to the present-day semaphore, although it had a limited number of characters.

In 1864 the Navy also adopted a system of chronosemic signals. (Chronosemic, a word made up of two words signifying time and sign, means employing intervals of time with a fixed significance.) These signals consisted of hoisting and lowering a flag or exposing or masking a lantern, ball, or similar object. When fog or mist interfered, a trumpet was used. Communications men using the chronosemic signal system showed and hid the lantern according to understood formulas, and these long and short patterns of light were the first attempt to form dashes and dots, the later basis for radio and blinker.

The Navy made an improvement also in 1864 with the adoption of the book entitled *Roger's Semaphoric Telegraph and Boat Signals.* Signalmen following the instructions contained in it used a canvas cylinder, secured to the shrouds, with a light inside it. This cloth lantern was held in a screened position by springs and exposed by pulling on a downhaul. After a long or short exposure, it was automatically pulled back into the screen position.

The *U. S. Naval Signal Code* of 1867 contains the first mention of wigwag, which is a means of signaling with only one flag or portable light waved according to a code. Movements of the flag or light to the right indicating a dot and to the left indicating a dash are the elements of the code alphabet. Movements to the front denote the ends of words and paragraphs. In 1867, however, an earlier and cruder form was in use. Different positions represented numerals from 1 to 0, and the numerals were assigned meanings, similar to those in the system of flaghoist signaling. Wigwag has now been discontinued in the United States Navy.

Electricity came into naval signaling in 1875 when experiments with electric lights were conducted. In 3 years, the ranges by flashing light were increased from 6 miles to a distance of nearly 17.

In the 1880's the Navy interested itself in carrier pigeons as a means of efficient communication. As late as 1889 Lieutenant Richard Wainright, USN, advocated their use and pointed out that from 1855 until the laying of the Atlantic cable, pigeons had been used to fly the news from Atlantic steamers to the Sandy Hook telegraph station. Pigeon lofts were established at Newport, Portsmouth, New York, Key West, and Mare Island. The development of radio has tended to eliminate the use of pigeons except to a limited extent in lighter-than-air service.

NO COMPASS NEEDED
In spite of tremendous advances made in communications during recent years, pigeons are still used on certain occasions to get a message through.

In 1898 the Navy officially adopted its first mechanical semaphore. The book *Instructions for Signaling, USN*, gives the following description of the new equipment, "A semaphore apparatus has been fitted for trial to the mainmast of the *New York.* It consists of four pairs of wooden arms pivoted at the middle of their length to the topmast."

Though the British still use mechanical semaphore, the Americans have discarded it in favor of hand semaphore.

Though radio rather than the transatlantic cable laid in 1858 and telegraph may be said to constitute the real revolution in communications, American history might have to be rewritten if the cable had come earlier. The United States would probably never have fought England in 1812 if there had been an Atlantic cable, for England suspended the Orders in Council, the chief American grievance, the day before war was declared in Washington. Perhaps the most important American military victory in that war was the Battle of New Orleans, fought two weeks after the negotiators decided upon peace at Ghent.

The effect of the absence of cable communications between Washington and Admiral Dewey (the cable had been cut) resulted in the sinking of the Spanish fleet in Manila Bay. Had the cable been intact, there would have been no attack, for at the very moment that our ships were moving into their positions and our troops were holding themselves in readiness for a dash upon the Spanish works, the peace protocol was being signed in Washington. The news of peace did not arrive in Manila until four days after the Spanish surrender.

Washington may not have excessively regretted the Dewey victory, but it recognized that we certainly needed reliable and extensive cable connections in the Pacific. Consequently the Navy was given orders to survey the Pacific for the purpose of connecting by cable the Pacific coast with the outlying colonial possessions of the United States in the Pacific and with China and Japan. The Navy went to work and explored, surveyed, mapped, collected data on winds, tides, and currents on a 30,000-mile cruise lasting eight months during which nearly everyone connected with the mission fell ill from lack of fresh food. The Navy also acquired Midway and added it to the Navy's communications system. Cable installations permitted the first 'round-the-world message on 4 July 1903.

Communications in World War I

During the Civil War and the Spanish-American War the Navy had been more or less dependent upon the Army for the maintenance of contact with dispersed forces. The Army Signal Corps bore the brunt of these responsibilities. During World War I, however, the situation was reversed and the Navy's radio facilities both in France and in the United States kept American Expeditionary Forces in contact with Washington.

With communications on shore the United States Navy did a masterful job; but, with communications at sea the Navy found itself in difficulties when the shooting began for us in 1917. In fact, the difficulties were so serious that we had to install British communicators on the bridges of our vessels not only to enable us to work with the British fleet but also with our own to bring antiquated methods up to date.

For many years a small group of officers in the American Navy had insisted that we had paid too much attention to gunnery and engineering in the training of line officers and too little to communications. World War I and British communicators on our bridges brought our dilemma into sharp focus.

When the war broke in Europe in 1914 the Navy realized at once that we might be drawn into the conflict and that we should map our course as soon as possible. It had to consider first, however, what it should do about our own neutrality and our relations to belligerent countries. Our procedure was logical enough. We prevented belligerent ships entering our harbors from using their communication equipment. We prevented our own radio stations from being exploited illegitimately, and naval officers imposed on them censorship that was severe or lenient depending on geography. When on 6 April 1917 we entered the war, the President directed the Navy Department to take over such radio stations within the country as might be required for naval communications and to close all radio stations not necessary for naval communications. Eventually no stations in the United States were operating except under Army and Navy control.

The story of the complexity and immensity of naval communications even during World War I is lengthy. The Communications Office in Washington averaged 3,200 messages a day. Messages concerning warship movements, convoys, routes of merchant ships, and overseas movements of troops and cargoes went through the Communications Office. Twelve codes and 26 ciphers were being used and changed constantly.

The Communications Office put into code messages of the State Department requiring special secrecy and handled confidential messages to the President from Colonel House, his unofficial representative in Europe.

One of the most ambitious projects of the Navy was the construction of the radio station named Lafayette in France, which was erected with the help of the French Government. The Germans had cut our cables several times, and although we effected repairs, we were still apprehensive about inadequate service. From radio station Lafayette we sent the first radio message heard 'round the world.

Naval Communications in World War II

During the past war the Naval Communications Service established and maintained a complete and comprehensive shore communications system which serviced all naval operating forces. Very little has been said about the role of the Communication Service in the Navy's great war record. There were two reasons for this silence: first, military security; second, the close integration of communications with so many activities that one can hardly point out any one achievement and say, "Communications gets the credit."

From 1939 on, the Naval Communication Service developed its facilities to such an extent that at the peak of the war effort it had established one of the largest and most complicated communications systems in the world. Employing all known means and methods of rapid communication, the Service enabled our vast and diverse forces to operate as a team on all our farflung battle fronts.

Meeting the three supreme requirements—reliability, security, and speed—the Naval Communication

NAVY
COMMUNICATION
C P

NAVY COMMUNICATION COMMAND POST
Six Navy men ashore somewhere in France are on the alert to coordinate the efforts of land and sea forces.

Service helped to pave the way for great naval victories over our enemies. It made joint operations among Army, Navy, and Air Force possible, and it brought together nations that did not speak a common language.

The Naval Communication Service facilities also cooperated with the American Red Cross representatives who conducted a program of home, hospital, and social service for personnel of the Navy. The Naval Communication Service handled important personal messages for naval personnel in matters of destitution, illness, and death.

In time of war, letters from home are as important to military personnel as ammunition and food. During the past war the Naval Communication Service was given the responsibility of handling all United States mail for the Naval Service and established over 5,000 Navy post offices ashore and afloat, manned by 20,000 personnel. Despite the tremendous load—in August 1945 over 3,000,000 letters per day were being dispatched to the Pacific and a like number being received daily at Fleet Post Office, San Francisco—spectacular results were achieved; for example, our men received airmail off the Normandy beachhead at D-day plus one, some of which was only five days out of New York.

Press and radio facilities gave the public grandstand seats for the best-reported war of all time. Correspondents from all the news associations and broadcasting companies, and newspaper men and magazine publishers accompanied the task force in each campaign. They were provided with radiophoto transmitting service, complete broadcasting studios, and radioteletype service sufficient to transmit large volumes of news stories to the home front.

The Navy has long recognized the value of the radio amateurs, or "hams," and has kept in close contact with them during peacetime and given them all possible aid. This interest paid dividends during the past war, for from this group came the nucleus from which the Naval Communication Service built its wartime expansion.

Women, who have always been expert in the dissemination of news, were assigned as WAVES in large numbers to communications duty and served as watch officers, performed cryptographic duties, routed traffic, and operated radio equipment and teletype machines.

COMMUNICATION ORGANIZATION

The Naval Communication Service

The Naval Communication Service is the organization under the Chief of Naval Operations charged with the administration and operation of all United States Navy communication systems. It should be noted that the Naval Communication Service is, in general, concerned only with exterior communication facilities; shipboard internal communications, such as announcing systems and battle telephones, are not controlled by the Naval Communication Service.

An officer of the rank of rear admiral under the Chief of Naval Operations is entitled Chief of Naval Communications (CNC) and is responsible for the administration of naval communications. He has cognizance of this service wherever and by whatever means it is carried on.

A central communication office, established in the Navy Department under the immediate cognizance of

WAVES IN COMMUNICATION DUTY
After 16 weeks' training at radio schools, Waves during World War II were assigned to naval shore stations.

the Chief of Naval Communications, provides direct communication, through shore radio stations, to units afloat, and to shore activities. Communications both ashore and afloat are in general organized on the basis of the chain of command. The Navy Department communicates directly with the various district commandants and fleet commanders, each of whom maintains communication with all parts of his organization.

Under the authority of the Chief of Naval Communications various publications are distributed to the Naval Service for coordination and control of communications. These include JANAP's; Communication Circular Letters, numbered serially, and usually containing information and instructions of a special or temporary nature; codes and ciphers, and instructions for using them; and corrections and changes to all these publications.

Each commander afloat or ashore is assigned definite responsibilities in connection with that part of the Naval Communication Service under his jurisdiction. He is assisted by all officers under his command in carrying out these duties, although certain personnel are specifically assigned to the various types of communication duty.

Communication Stations

A communication station includes one or more of the following component activities, facilities, or units:

1. Communication (signal) center
2. Message center
3. Relay station
4. Radio transmitting station
5. Radio receiving station
6. Communication control link relay station
7. Radio photo unit
8. Visual signal station
9. Officer messenger mail
10. Communication officer's office
11. Fleet Post Office (outside continental United States)
12. Communication security activity
13. Communication supplementary activity or detachment

Components numbered 1 through 11 (above) may be assigned to, or be a part of, any shore station: but those numbered 12 and 13 are normally assigned only to a communication station, a ship, a flag command afloat, or a fleet headquarters on shore.

A communication (signal) center, the first component listed above, is a communication functional organization comprised of one or more of the following components:

1. Message center
2. Crypto center
3. Relay action
4. Wire and/or telephone room
5. Radio station: Transmitting, Receiving, Control, Link
6. Radio photo unit
7. Visual signal station

A registered publication issuing office (RPIO) may include either or both of the following:

1. Officer messenger mail center
2. Cryptographic reproduction center

The Navy's shore communication system exists primarily to serve the fleet, (that is, our mobile units—ships and aircraft) and to serve our overseas possessions and bases. Together with our fleet communication facilities, the shore communication system forms a vast, highly organized network that covers the entire world. The shore system consists of five primary radio stations and many smaller radio stations. The five primary naval communication stations are located at Washington, San Francisco, Balboa, Honolulu, and Guam; the heart of this network is Radio Washington. Fleet radio broadcast means the sending of messages on one or more frequencies without requiring receipt or acknowledgment from the ships addressed. This system enables ships at sea to maintain absolute radio silence. The ships copy all designated scheduled transmissions and thus receive any message addressed to them; important messages are frequently repeated on subsequent broadcast schedules.

Besides the radio organization, there are Navy landwire (telephone and teletype) operations. Wire teletypewriter circuits extend to Canada, to numerous points in continental United States, to offices of the commercial carriers, and to many government departments.

San Francisco and Washington are the principal overseas terminals of the Naval Communication Service. Each naval district has its communication center

NAVY AND ARMY WORK TOGETHER
Outfitted with radar and electronic devices, AGC's (amphibious force flagships) serve as floating headquarters in amphibious landings.

and radio stations as required to tie the command together and connect it to other local government activities and to Washington.

Communication Organization of a Large Ship

The communication office of a ship is the central agency for the handling of all rapid communications. It is usually located adjacent to the main radio station (Radio I) and the crypto center. Outgoing messages are delivered in rough to the communication office where they are written up in smooth form and prepared for transmission. Neccssary releases are obtained by enlisted or officer messengers, as appropriate, and when in all respects ready for transmission a message is passed to Radio I, the signal bridge, or to the captain's office, for transmission by radio, visual, or mail, respectively. All incoming messages are delivered immediately to the communication office for writing up, internal routing within the ship, and eventual filing.

The crypto center is an office space that usually opens into the communication office. It is equipped with crypto aids, a safe for stowage of codes, ciphers, and publications not actually in use; file cabinets for stowage of confidential and secret message files; and desk space with typewriters for use as required. Access to the code room is permitted only to assigned personnel, and the crypto center is kept locked when not manned.

Large ships are usually fitted with three radio rooms. Radio I, or main radio, is the primary receiving station. Most of the ship's receiving equipment is located there, and each receiving position has a key for remote control of the transmitters, which are located in other parts of the ship.

Radio II is the transmitter room containing the majority of the ship's transmitting equipment. The watch in Radio II normally consists of a petty officer in charge, assisted by one or more strikers. The duties of the watch are to keep transmitters tuned to prescribed frequencies and connected to the desired keys in Radio I or in other parts of the ship. Frequency-measuring equipment is provided in Radio II so that transmitters can be tuned accurately without going on the air.

Radio III is the emergency radio room, isolated from Radio I and Radio II, and contains several transmitters and receivers for emergency use; it is provided with an independent power supply in case of failure of regular ship's power. Usually a watch is maintained in Radio III only during general quarters.

Remote-control transmitting and receiving positions are located in various parts of the ship, such as the bridge or conning tower, the flag bridge, and the combat information center. Receivers in Radio I and transmitters in Radio II and III may be connected to these remote-control positions as desired, and those on the bridge and combat information center in particular are manned constantly underway.

The signal bridge, located in the vicinity of the navigation bridge, is the station from which all visual messages are handled by flaghoist, flashing light, and semaphore. The signal bridge is manned continuously; the watch varies in size and composition, depending upon operating conditions. Visual messages are normally cleared through the communication office, except that those of immediate importance are first delivered directly to the captain and officer of the deck, or are sent out directly from the signal bridge as ordered by the captain or officer of the deck.

The captain's office, which is not under communications, is charged with the handling of all official mail sent or received by the ship. Official letters are mailed, routed, and filed by personnel of the captain's office.

Standard ship's organization places responsibility for communications in the operations department. Under the operations officer there is assigned a communication officer charged primarily with responsibility for visual and electronic exterior communications and for administration of related internal systems. The communication officer's duties are discussed in Chapter 12. His assistants may include a signal officer, radio officer, and officer in charge of registered publications.

The ship's secretary, under the executive officer, is charged with the care and routing of all ship correspondence and with the operation and maintenance of material used in connection with it.

Under the operations officer there is also assigned a combat information center officer (see Chapter 12), who is charged primarily with the operation and maintenance of the combat information center and its equipment. He may be assisted by an aircraft control officer, intelligence officer, radar officer, lookout and recognition officer, and underwater search officer.

Junior officers stand watches as communication watch officers in the ship's communication office. The communication watch officer on duty is directly in charge of the communication office and Radio I, and indirectly in charge of the signal bridge watch and Radio II and III; he supervises the handling of all dispatches received or sent by the ship and is responsible for their prompt and proper delivery. This watch normally is continuous when underway and on a day's duty basis when in port. Also, communication watch officers usually function as assistants to various other officers assigned to communication duty and are in training as reliefs for them.

In small ships, obviously, no such large communications organizations is possible. The officer detailed as communication officer carries out most of the duties listed above, assisted by one or more other officers if available.

Cryptoboards are always so constituted as to include commissioned officers as members, but they may, in addition, include warrant officers and petty officers of superior trustworthiness and loyalty. However, only specifically designated commissioned officers may encrypt, decrypt, see, deliver, file, or have custody of top secret messages. Only commissioned officer members of cryptoboards may encrypt or decrypt secret messages. The communication officer is the head of the coding board and is responsible for its indoctrination and general functioning. Instruction and drill periods, usually held several times a week, are supervised by the communication officer and his most experienced assistants. Crypto personnel must be instructed not only in the mechanics of using the various codes and ciphers but also in the principles of cryptography and communication security.

The crypto officer is responsible for the technical accuracy of encryption and decryption; for selection of the crypto channel (system); for advising originating officers as to arrangement of text for increased security; for safeguarding of classified message files, and information coming to their attention; for clearing of garbles and rectification of errors; and for preparation of paraphrased copies of messages. (Paraphrasing is a process of rewriting the exact translation of an encrypted message in order to protect the cryptographic system from compromise.) In the course of his duties, the crypto officer has access to information and plans of vital importance during war and must constantly bear in mind that the contents of messages may be disclosed only to officers whose duties require such knowledge since, according to *Navy Regulations*, "An officer, by virtue of his commission alone, is not authorized to have knowledge of secret or confidential matter."

Under wartime conditions, the workload of the cryptoboard is very heavy since then almost all messages are transmitted in encrypted form. During underway periods, a continuous watch is maintained in the crypto center, and in port cryptoboard personnel stand watches on a day's duty basis. During peacetime, the majority of naval messages are sent in plain language form.

Enlisted personnel whose duties are connected with communications include quartermasters, radiomen, and telemen.

Types of Messages

The various types of messages handled by the communication organization are as follows:

A *message* is a communication expressed in brief form, as in the case of dispatches, signals, and procedure messages.

A *dispatch* is any message other than a signal or a procedure message. Dispatches may be classified according to means of transmission as visual dispatch, radio dispatch, landline (telegraph or teletype) dispatch, guard mail, mailgram, or airmailgram.

A *signal* is a message whose text consists of one or more letters, characters, signal flags, visual displays, or special sounds with prearranged meanings.

A *procedure message* is a brief communication between operators employing prescribed procedure, and essential to traffic handling or station operation.

Speedletters are short communications written in dispatch phraseology and handled as official mail. They are for matters of urgency not requiring telegraphic transmission. They are adapted to direct communication only. The regular form of official correspondence must be used for matters requiring forwarding endorsements. Routing, filing, and handling of speedletters are accomplished by the ship's secretary. Though they are written in communication language they are not handled by the communication center.

Fleet Communications

The operation plan as issued by fleet commanders is supplementary to the *Communication Instructions*. Most of the permanently organized task forces have detailed plans in effect for communications within the force. These various sets of instructions issued within the echelons of command amplify the basic plan and doctrine and must not conflict with it.

Units of the fleet are usually parts of both an

SHIP-TO-SHORE RADIO

Ship-to-shore radio is used extensively in invasions. Commanders must be able to direct landing parties where to go, what to look for, and when to strike at the enemy.

administrative and a task organization; task organization communications have priority over administrative. Communications within the fleet are organized on the basis of the chain of command. Ships of a task force are usually in direct radio communication with one another and with the task force commander. Each task force commander, in turn, maintains direct radio communication with the commander in chief of the fleet concerned on the task force commanders' circuit. The basic doctrine provides flexible radio frequency plans for numbered task forces with complete sets of primary and secondary frequencies assigned to numbered task force subdivisions. Aircraft communications are also included.

METHODS OF COMMUNICATION

Radio Systems

Radio is the Navy's most important means of communication not only because it is speedy but also because it is the only effective means by which the activities of widespread naval forces may be continuously coordinated.

The four systems of radio communication are radiotelegraph, radiotelephone, radioteletype, and facsimile.

Radiotelegraph, the primary system of transmission by radio, is the most rapid of all methods of transmission. It is best adapted for communication to, from, and among widely separated units and is the most important of all systems used by the Naval Communication Service. In radiotelegraphy the speed of transmission depends on the ability of operators and on circuit receiving conditions. On a circuit with high-noise level and with a poor operator the speed of transmission is much lower than on a circuit with little noise and an expert operator. The International Morse Code is prescribed for all intranaval transmissions by telegraphic systems, including radio, visual, and sound.

The principal methods used for the transmission of naval messages by radiotelegraph are the receipt (R), broadcast (F), and intercept (I) methods.

The *receipt* method is the one whereby both the transmitting and receiving stations may use their transmitters in order to effect delivery of messages and in which the transmitting station requires and obtains a receipt for each message transmitted. This is the normal method of handling ship-to-ship, ship-to-shore, and aircraft traffic.

The *broadcast* method is the one whereby the messages, though addressed either directly or indirectly, may not be receipted or transmitted. This is the primary method for delivery of messages from shore stations to the forces afloat.

The *intercept* method is the one whereby one station transmits to another messages addressed to stations which merely listen, or intercept, on the frequency concerned. The second station receipts for transmissions, usually repeats back all messages, and thus gives intercepting stations an opportunity to double-check their reception. A slow method, it is seldom used in the Naval Communication Service.

Radiotelephony, the transmission and reception of voice by radio, is utilized by the Navy primarily for comparatively short-range tactical communications by aircraft and surface ships, because of its directness, convenience, and simplicity of operation. For battle use, radiotelephone has one serious disadvantage in that voice transmissions are easily affected by static, enemy interference, and local noise caused by gunfire or bomb and shell bursts. The success of radiotelephone communication depends in no small part on the individual operator's ability to speak clearly and to follow established procedures in the use of his equipment.

Because of its importance, radio must be restricted to situations in which it is indispensable; radio channels should be kept clear of all matter that can be handled by other means, so as not to interfere with traffic that must be handled by radio. To this end, all possible use is made of alternative systems of communication.

A control station is designated on every radio circuit and is usually the senior station on the circuit. It has responsibility for the clearing of traffic and maintaining of discipline on the circuit. A control station may prescribe by appropriate operating signals that its permission must be obtained by any other sta-

TELETYPE SPEEDS COMMUNICATIONS
Radioteletype raised fleet radio broadcosts of 25 words per minute to new highs during World Wor II.

tion before transmitting; this is frequently done on nontactical circuits in order to give the control station complete control.

High-speed radio circuits on shipboard are a comparatively new development. A number of flagships, particularly AGC's (amphibious force flagships) are equipped with high-speed transmitting and receiving equipment involving the use of a perforated tape for transmitting at speeds up to several hundred words per minute and a tape receiving and transcribing signals at a convenient speed by means of dots and dashes. The high-speed transmission is used from ship to shore, usually at speeds around 75 words a minute, and this can be done conveniently without special modification of standard Navy transmitters. With speeds above those manually operated, a preliminary call-up with the shore receiving station must be established and the shore station arranged to turn on the automatic recording equipment. Then it is usually possible to transmit all traffic that is ready, although on some circuits where a separate frequency is used from shore to ship, the shore station can interrupt if interference makes it impossible to copy the high-speed signals.

With this system, the shore station acknowledges having received the tape but does not actually receipt for the transmitted messages until operators transcribe the transmitted material on message blanks and ask for whatever repeats are necessary. This procedure takes several times as long as the actual time required for the transmission of the messages.

More recently there has been a trend toward the use of a completely automatic type of equipment—namely, radio teletype. This equipment operates at about 60 words a minute. On some circuits, the machines are connected directly to the radio equipment so that it is possible to transmit simply by typing the transmission on one of the machines. Where heavier traffic is handled, it is generally desirable to perforate the tape with the transmitted material so that the radio circuit can be operated at its maximum possible speed without regard to the typing speed of the operator.

Radar

Radar overcomes visual limitations; that is, it can reach beyond the visual horizon; it can detect through darkness, fog, and smoke as well as through sunshine. It enables its user to prepare a plan of action against an enemy before that enemy knows that he has been seen.

The word *radar* comes from the beginning letters of the phrase *ra*dio *d*etection *a*nd *r*anging. Radio is the basis of radar, and in developing radar, use was made of the fact that radio had all the necessary elements for the development of a detection and rangefinding device: a transmitter, which is the source of the vibrations; a megaphone—the antenna—through which the transmitter "shouts"; and a receiver, capable of amplifying weak signals. Final part is the indicator, called an oscilloscope. Beamed transmission of electro-magnetic waves is the method by which energy is directed to a target. The signal is reflected back by the target to a receiver at the transmission source. Although the radio waves used in radar travel much faster than sound waves and in a different medium, they obey the same physical laws.

The principles of sound echoes is the basic principle of radar; it is echo ranging—sending out brief pulses of energy and measuring the time it takes them to return. A strong pulse of radio energy is sent out into space from the radar. If there is a target, such as a ship or aircraft, in the path of this radio energy, some of the radio waves rebound on striking the target just as do sound waves and produce an image seen on a special device called the cathode-ray tube. Radar transmission is accomplished by split-second pulses of energy alternated with periods of no transmission, during which the image is allowed to return.

Radar was originally devised as a warning instrument to detect aircraft and thereby protect ships and shore installations from surprise attack. However, practice and experience soon demonstrated that it was capable of performing many more duties. An experienced operator by observing the oscilloscope could tell whether the target was a battleship, destroyer, aircraft, or a number of targets; he could learn not only the enemy's location but also his direction, speed, elevation, and approximate number of individual targets, if it was a group. It was found that the bearing and ranges obtained from radar could be used in aiming and firing the guns of a ship. This was worked on and finally developed into fire-control radar.

Information obtainable from radar is very useful to the fighter director officer. From it he can determine the number of fighters to send up and what sector and altitude to give them so that they can intercept and defeat the enemy. Coordinating all the information from radar and other sources enables the fighter director officer to decide which targets are dangerous and must be attacked, and which require only watching.

A special type of remote-control indicator known as the plan position indicator (PPI) is capable of repeating what is on a radar screen. During the past

RADAR: MAGIC EYES OF WORLD WAR II
Viewing the enemy's actions with electronic equipment, specialists in the radar plot room of an aircraft carrier plan operations for defense and attack.

war, the PPI was especially helpful to ships which were in formation. When a ship gets out of position, the change is immediately indicated, and action can be taken to get it back in place.

Fleet action in and around Attu revealed the usefulness of radar to a task force in supporting landing operations. Fog made the visibility nearly zero but did not prevent the fleet from accurately directing its fire in support of landing craft. Elsewhere in the Pacific, radar was used to direct gunfire during night bombardment of Jap shore installations.

The peacetime possibilities of radar are many. It is rapidly becoming indispensable in the ground-controlled landing of aircraft. It is useful to all ships as a valuable aid to safe navigation.

All information regarding radar was a closely guarded secret throughout World War II, but actually radar was no sudden development of that war. As far back as 1922, it was known that radio waves could be reflected. By 1930, experiments had progressed far enough so that an airplane could be detected in flight. Continued progress made it possible in 1934 not only to detect aircraft, but to obtain its direction and distance.

Radar played a major part in the defeat of the Luftwaffe's plans to bomb Britain off the map. Without radar, the Air Ministry has said, the Battle of Britain, one of the greatest decisive battles of all history, would have been lost.

On a Sunday evening, 17 January 1943, the Luftwaffe launched an attack on London in reprisal for RAF raids on Berlin. There was a bright moon and everything seemed to be in the enemy's favor. To their complete surprise, the searchlights, which formerly had scanned the skies in futile search action, now followed the planes with uncanny accuracy. Radar was not only directing the few planes of the RAF to the right spot at the right time but aiming the searchlights and guns as well. This performance convinced the German High Command that their intelligence service had erred greatly in estimating the strength of the Royal Air Force.

Another illustration of the effectiveness of radar occurred in the Battle of Midway. A large Japanese force was approaching the island on which there were several squadrons of land-based bombers, and near-by was the carrier *Yorktown*. Without radar a continuous patrol depending on visible detection would have been necessary but with radar the enemy was detected while still about a hundred miles away, and his course was plotted. The Japanese were first allowed to close in (to save our fuel), and the carrier planes and land-based bombers were then sent to attack. Directed by the large radar stations on the carrier and on Midway, our pilots went straight for their targets. Our force, although outnumbered, was able to disperse and defeat the larger Jap force by the use of radar.

NAVY PATROL BOMBER FIGHTS ENEMY RADAR
Marine captain operates radar countermeasures equipment. He is peering into a direction finding indicator.

Loran

The development of loran has increased navigational safety and precision. Loran is an electronic navigation system that provides accurate positional data in daylight or darkness, in clear or foul weather. The word *loran* comes from the term *lo*ng *ra*nge *n*avigation.

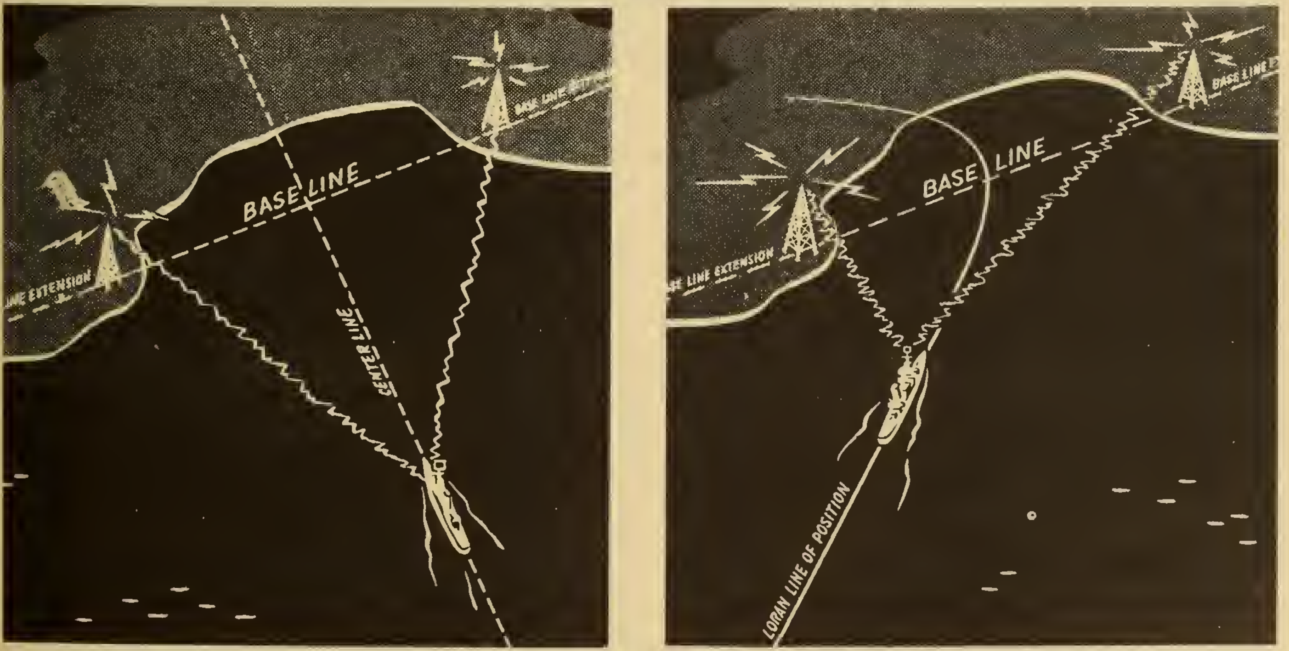
Events in Europe in 1940 brought about the establishment of a Loran Division under the auspices of the National Defense Research Committee (NDRC). Work was undertaken at Massachusetts Institute of Technology the following year, and in 1942 the first transmitting station was placed in experimental operation. The first units were set up in the North Atlantic area by the United States Navy in cooperation with the Royal Canadian Navy and NDRC. During the Battle of the Atlantic the loran chain of transmitters was extended to embrace the Atlantic seaboard. Jap activity in the North Pacific led to the establishment of the Aleutian loran system late in 1942; later, loran stations were set up on many of the islands of the Pacific.

Today approximately 40 loran stations are being operated by the Coast Guard, and more will be constructed as time goes on. It has been estimated that the major air and sea traffic routes of the world can be covered with about 70 stations. Navigational safety can be aided by loran in peactime as well as in war.

Before loran was introduced in World War II, ships on the open sea kept their position and course accurate by using lines of position determined from the stars. This was celestial navigation. But celestial navigation presented many problems to the Navy navigator. He was completely at the mercy of the weather in making his observations. Cloudy or overcast skies, lack of a clear horizon, fog or rain—all kept the navigator from finding his position for as long a time as they persisted. Even when the weather was favorable, sights could be taken only during short periods at sunrise and sunset. And after celestial observations had been successfully taken, there remained a long and complicated calculation, full of chances for error, before the lines of position on which the ship lay could be plotted and a fix obtained.

With the development of loran, this entire procedure has been changed. The loran gridwork of radio energy is established by pairs of transmitting stations located on coastal promontories and islands all along the world's traffic lanes. A single pair of these transmitting stations provides lines of position for the Navy's navigators.

Two stations, one known as a "master" station and the other as a "slave" station, transmit synchronized



LORAN

Two loran stations send out pulses simultaneously and these pulses arrive at the same time on the center line. A ship reading a time difference of zero has established location on one line of position, the center line. If one pulse arrives at the ship first, the loran registers a time difference. The ship is somewhere on a curve closer to the station whose signal was received first. This curve is a parabola on any point of which the same station pair would produce the same time difference. Two of these parabolic lines determine a fix. The crossing of the lines is the ship's position.

pulses of radio energy on a determined frequency. These pulses are received by the ship's loran gear which measures the difference in the time of arrival of the two signals. If pulses from the paired stations are received at the same time, the ship is equidistant from both stations and somewhere on the line of position which is perpendicular to the line connecting the two stations.

If the ship's loran receiver shows a difference in time, then the ship must be closer to one station than the other and lie along another line of position. For any given time difference there is a great number of positions which, when plotted, form a curve around the station whose radio signal is received first. Thus the navigator reads the time difference from his loran gear and knows that his ship is located on the curve that corresponds to the time difference. When readings from two pairs of stations are taken, two lines of position are established and their crossing provides a fix.

This fix is, however, only a fix on the loran gridwork of radio energy. To convert it to position in terms of latitude and longitude, loran charts have been prepared which have overlays on the time-difference curves corresponding to each set of stations printed on regular mercator charts. In addition there are tables available for all stations which may be used to convert mathematically the loran readings into lines of position on a mercator chart which does not have the curves printed on it.

Sonar

The word *sonar* is derived from the first letters of the phrase *so*und *n*avigation *a*nd *r*anging. The use of sound waves is necessary in detecting submarines due to the fact that neither light nor radio waves can be transmitted for any distance underwater.

A metal object called a projector extends from the bottom of an antisubmarine ship and sends out powerful sound waves into the water by making a quick, sharp vibration that is called a transmission. These vibrations form a cone-shaped sound beam—like the beam from a searchlight—and this sound beam can be trained in any direction.

If the sound beam strikes an object in the water, an echo is reflected back to the ship, and the projector picks up this echo and sends it through the sonar equipment to the ears of the sonar operator. From these echoes, the sonarman determines the submarine's location, its distance, its direction of travel, and its speed.

The sonar operator aboard ship sits before a remote-control sonar unit called the stack; he trains the sound beam through the water by a handwheel that controls the projector. The sound beam is sent out into the water and the operator can hear the long, rolling reverberations as the beam of sound travels out and sends back small echoes from everything it meets. The operator searches the underwater ocean area with this sound beam according to a set procedure until he hears the echo that means the sound beam has struck a submarine. With training and practice, the operator is able to distinguish among sound echoes.

Basic sonar equipment includes three primary units: the driver, the projector, and the receiver-amplifier. The driver, or generator, generates an alternating signal of the required frequency. This signal is led to the transducer or projector, causing it to vibrate and thus transmit into the water a supersonic note. Because of its design, the projector limits the direction of the transmission to a relatively small arc. The driver is connected to the projector only at intervals, for a short period, and thus sends out a series of "pings." During the interval between pings, the projector is connected, through a keying relay, to the receiver-amplifier. If the outgoing sound wave strikes a solid object, part of the energy is reflected in the form of an echo. This returning echo is picked up by the projector and is amplified and made audible by the receiver-amplifier. By timing the interval between transmission and echo and applying this time to a range scale, one can obtain an accurate range. Noting the train of the projector also gives the operator a fairly accurate bearing. Because of the better directional qualities of higher-frequency sound, supersonic sound waves (14 kc to 30 kc) are used in conventional sonar gear as the searching agent.

Visual Communications

Ships at sea use visual signaling to a considerable extent; it is also of major importance for tactical purposes and operational routine. For these reasons all watch officers, as well as the signal officer, must

"FLAGGING IN" AN LST
An LST is directed to a safe beaching position with semaphore signals.

be proficient in visual communication. Enlisted personnel qualified in the operation of such devices are assigned to ships. In any case, an officer is finally responsible for the accurate transmission and reception of visual communications aboard ship, for the proper interpretation of signals, and for correct action. Often an officer will find necessary not only the supervision of enlisted personnel in visual communications but also the actual operation of visual signaling devices. The three types of devices are semaphore, flaghoist, and flashing light.

Semaphore. Semaphore and flashing light can be used interchangeably for many purposes, but semaphore is more rapid for short-distance transmission in clear daylight and may be used to send messages to several addressees at once if they are in suitable positions; also, because of its speed, semaphore is better adapted to the sending of long messages than are other visual methods. When radio silence is imposed, semaphore is the best substitute for handling administrative traffic. Further, it is more secure than a light or radio because there is less chance for interception by unauthorized persons.

Especially during World War II there was a tendency for semaphore to replace flashing light wherever practicable. When operating in the vicinity of enemy-held territory, most commanders imposed strict flashing-light silence and relied solely upon semaphore and flaghoist for visual signaling.

Standard semaphore apparatus consists of two hand-flags employed to form characters (see Appendix). The arms are placed at the exact positions indicated, a distinct pause is made at each position, and the arms are moved from one position to the next by the shortest possible motion. The procedure used both in flashing light and semaphore is not only based on radiotelegraph procedure but is much like it in many details.

Flaghoist calls, as a call-up for semaphore messages, are used extensively, but at anchor only. The calling

TRAINING IN FLAGHOIST SIGNALING
Student officers at Naval Training Center in Miami practice with flags they will later use at sea.

station hoists at the yardarm the call-sign of the station being called. The latter then hoists the calling station's call-sign over the answering pennant, two-blocked to signify readiness to receive the semaphore message. The receiving station receipts by hauling down.

Flaghoist. Flaghoist signaling is the most rapid and accurate visual method when in easy signaling distance in daytime. It should normally be the primary tactical maneuvering and order method of transmission between surface units whenever visibility conditions permit. Signals are normally repeated by the addressee, thus providing a sure check on the accuracy of reception. Texts of messages which may be conveyed directly by flaghoist are limited by meanings contained in the signal books employed.

The Navy uses flaghoist signaling mainly to convey tactical and informational messages of reasonable length during daylight, between ships that are in close company with each other. Flaghoist, rapid and accurate, is considered the best way to insure uniform execution of maneuvers. In signaling by flaghoist the United States Navy uses the international alphabet flags, numeral pennants, and the four repeaters, plus a set of special meaning flags and pennants, and ten numeral flags that are not part of the international system. Each flag and pennant has a name, various flags have particular meanings, and almost all hoists are coded signals. When naval vessels are underway in formation, flaghoist signaling is reserved primarily for the transmission of collective-address signals by unit commanders. But it may also be used for sending noncollective-address signals in the transmission of signals directly pertaining to current operations, and for transmission of routine reports requested for unit commanders.

Flashing Light. Flashing light communication is a visual telegraphic system using the International Morse Code (see Appendix). Like all visual methods, it is best adapted to tactical traffic, though its use is not so confined to operational messages as is flaghoist. Short administrative messages are often sent by flashing light instead of by radio. It can be used interchangeably with semaphore. In peacetime, the lights are used at night, when semaphore cannot be seen. Flashing light is usually used, either by day or night, when considerable distance is involved.

Flashing light messages are sent by two general methods—directional and nondirectional. Directional flashes, those aimed at a particular receiver, are produced by means of communication searchlights in the daytime and by multipurpose lights either by day or

BLINKER SIGNALING
Blinker signals are used at night during radio silence. Their brilliant gleam is a welcome sight to aviators returning to carriers after a night mission.

night. Nondirectional flashes are those which may be seen in any direction and are produced by yardarm blinkers or by communication searchlights. Such all-around lights often have the advantage of affording quick and simultaneous delivery of messages to a whole group of ships or aircraft within visual distance. However, they lack security and as a result are seldom used at night during wartime, even when in port. As a matter of fact, in wartime, any flashing light method of signaling is prohibited except for recognition and for transmission of messages that are sufficiently important to outweigh the need for preserving secrecy of location.

Yardarm blinkers are special nondirectional electric lamps located near the ends of the yardarm. They are operated from a key on the signal bridge or other signal station. Multipurpose lights (directional) obtain their electric power from batteries or from the ship's electrical supply lines. This type of light is flashed on and off by a trigger switch and is portable.

Infra-red. An infra-red light sends out rays invisible to the naked eye but visible with a special type of receiver. Infra-red equipment (also termed Nancy), employed by the United States Navy in the past war principally in flashing light signaling, can also be useful in reconnaissance, recognition, navigation, station keeping, and beach marking. It supplements standard blinker light with devices that make the signal invisible to the naked eye. Visibility is effected by a filter placed over any signal light with a special receiver enabling an operator to see the rays that filter through. The process may be likened somewhat to hearing a program on the radio; a station may be broadcasting all evening, but if your radio is not turned on to that station, you cannot hear its programs. Any ordinary electric light may be used to produce only infra-red rays if a filter is employed to remove completely all the visible light rays that are produced. The light so produced is beyond the normal visual range; the purpose of the receiver is to convert these rays to normal visual range.

The Navy found infra-red beacons useful for sending messages simultaneously to ships in formation. Marine Corps snipers carried rifles equipped with invisible light equipment and a receiver. The Jap was spotlighted by the invisible light, the receiver enabled the Marine to see him—and the well-aimed gun did the rest. Tanks and other vehicles equipped with infrared beacons traveled safely in complete darkness. Infra-red beach markers would have been useful for night landings but were not necessary since all major landing operations took place in daylight. The Germans used cameras loaded with infra-red sensitive film to photograph Allied defense installations.

NANCY: INFRA-RED LIGHT
The use of infra-red light for signaling was an innovation of World War II. The man shown is using a special type of receiver that enables him to see light signals invisible to the naked eye.

There are some disadvantages to the use of infrared. Fog, rain, and haze affect it in much the same way that they affect ordinary daytime signaling lights. In conditions of very poor visibility, the equipment may become practically useless.

Other Visible Signals. Flaghoist, flashing light, and semaphore are the standard methods of visual communication, but there are other visual methods that also serve vital functions in exchanging information between ships, or between ships and aircraft, or between aircraft and ground parties.

Specific kinds of information are transmitted by the following means: speed indicators (cones, pennants, flags, and lights), flag lights, pyrotechnics, message drops, panels, lights and shapes required by Rules of the Road. All of these devices have a more limited purpose than standard methods of visual communication but fill a definite and significant need in naval communication. Detailed knowledge of these devices is beyond the scope of orientation needs. The student who wishes to learn more about them at this time may consult any standard work on seamanship or communications.

Interior Communication Systems

Like any efficiently functioning industrial plant, a ship must have a system for transmission of information to, from, and among its various parts. Although a detailed description of the interior communication (IC) system is beyond the scope of a volume prepared specifically for orientation purposes, no discussion of the subject of naval communications would be complete without some mention of the methods of intraship communication.

In general, the interior communication systems in a ship provide the means of maintaining contact, transmitting orders, and relaying indications of the condition of certain machinery or other parts of the ship, to and among various stations in the ship. Each of the systems is designated to perform a specific function such as transmission of voice, transmission of an indication of heat or pressure, the degree of rotation of some device, the open or closed state of a valve or simple bell or light circuit; others furnish navigational information.

The majority of the interior communication systems are electrical and automatic in operation. Some, such as the motor order telegraph system, are manually operated but include an electrical circuit for the actual transmission of the order to another part of the ship. Some of the systems operate on alternating current, others on direct current; still others, such as the sound-powered telephone systems, operate on self-generated current.

Following are some of the more important IC systems and their circuit designations:

E: Telephone call
EG: Engine governor control and tachometer
J and XJ: Sound-powered phones
K: Shaft revolution indicator
LC: Gyrocompass
XLC: Auxiliary gyrocompass
TL: Dead reckoning tracer
CA: Collision alarm
G: General alarm
EC: Low-pressure lubricating oil and high-temperature water alarm
1 MB and 2 MB: Engine order telegraph
3 MB: Engine order control
BT: Marker buoy
1MC: General announcing
N: Rudder angle indicator

Most of the system names listed above are self-explanatory but a slightly expanded statement on some of the major types, indicating the specific type of information transmitted and the points from and to which it is sent, will serve to illustrate how vital these systems are to the efficient functioning of a ship.

Engine Order Telegraph System. The purpose of the engine order telegraph system is to transmit electrically, from the transmitting stations located in the conning tower and control room to the maneuvering room, any desired orders for the direction and speed of the propellers and to repeat those orders back to the transmitting station from the maneuvering room.

Rudder Angle Indicator System. The purpose of the rudder angle indicator system is to transmit electrically, the angular position of the rudder to various sections in the control room, conning tower, and bridge.

Engine Governor Control System. The engine governor control system is the system through which the maneuvering room controls the speed of the engines.

Shaft Revolution Indicator System. The purpose of the propeller shaft revolution indicator system is to transmit indications of propeller revolutions per minute and total revolutions from the propeller shafts to the control station in the maneuvering room.

BATTLE PHONE
Sound-powered phone in use in a submarine. Note the variety of gear that is assembled in this small space.

Engine Order Indicator System. The engine order indicator system is for the transmission of orders between the maneuvering room and engine room for engine operation.

Battle Telephone Systems. Battle telephone circuits are sound-powered circuits. Vibrations of the voice actuate a diaphragm and cause an armature to move in a field of permanent magnets, thus generating electrical current. Since no outside source of electrical power is involved, these phones may continue to function after all power systems of the ship have been put out of operation. The number of J or XJ circuits varies with the type of ship, but some of the usual types are: JA—captain's circuit; JC—main battery control; JL—lookout circuit; JS—radar and radar information; JX—radio and signals communication office; JZ—damage control circuit; JV—engineering circuit.

Certain types of ships are equipped with IC circuits that enable them to perform more efficiently the functions for which they were specifically designed. Examples of such systems are the diving alarm system on submarines and the flight deck control system on carriers.

Other means of communication provided within the ship are voice tubes and ship's service telephones.

COMBAT INFORMATION CENTER

Purpose

Before the development of radio, radar, and sonar, practically all the information concerning contact with the enemy came from lookouts on the bridge or on other posts about the ship. CIC is the answer to the need for an agency to coordinate the data received from all sources—lookouts, sonar, radio, radar, visual signals, and intelligence. CIC endeavors to pass along to the command only the essential information, uncluttered by irrelevant or unnecessary details. It serves as a center for the collection, evaluation, interpretation, and distribution of combat information, and for facilitating the use of that information.

In CIC, evaluation and interpretation are special terms with special meanings. Evaluation is the final consideration of intended movements of enemy units and their strategical importance. Related to but distinct from evaluation is the interpretation of combat information. By interpretation is meant the *routine* computations and reports such as courses and speeds, approach and retirement, relation of ship's position to land, and position of approaching enemy air attacks.

The CIC team is charged with the responsibility of keeping the commanding officer and higher commands embarked informed of the location, identity, and movement of friendly or enemy aircraft and surface ships within the area. In addition, when the tactical situation indicates and the limitation of space and availability of trained personnel permit, any or all of the following functions may be required of CIC:

Target indication
Control of aircraft in the area
Control of small craft in the area
Navigation and piloting (amphibious landings and shore bombardments)
Control of radar countermeasures
Assistance in antisubmarine operations

Coordination

To be effective, CIC must work in close coordination with other parts of the ship. The primary reason for the existence of the combat information center is to provide the conning officer with exact information correlated with other strategic and tactical information, so as to enable conn, the commanding officer or flag officer embarked, to determine a course of action. To this end, it is desirable that the officer of the deck and the CIC watch officer have a thorough understanding of each other's duties. To further the coordination between CIC and the conn, the commanding officer may require that every officer of the deck be qualified to serve as CIC watch officer, and vice versa.

CIC must also serve as liaison between torpedo control, main battery control, and plot. It must provide for an orderly flow over the sound-powered phones of all necessary data in the torpedo problem. The assistance rendered by the combat information center to the gunnery department is as varied as it is important. Briefly, CIC's duty in this connection is the rapid dissemination of available information to conn, flag officer if embarked, plot, and gunnery officer. This information may include navigational data, firing orders or spots, and tactical data affecting the situation.

One of the functions of the combat information center in sonar-equipped vessels is assisting the conn in antisubmarine attacks. The greatest direct aid CIC can render in an attack is in regaining contact after a run has been made. But in such operations, it performs many other tasks as well. Briefly, CIC serves as the "retentive brain" for the attack and as such must have the necessary information immediately available for forwarding to the conning officer.

The above paragraphs furnish only a brief indication of the ways in which the combat information center's duties are coordinated with other parts of the ship. The extent to which the possibilities of CIC's service to the ship as a whole are exploited will depend in no small measure on the command's understanding of this agency and of CIC's own understanding of the problem of command.

The combat information center is manned by a trained team consisting of officers and enlisted personnel (see Chapter 12). The size and composition of the teams vary according to the equipment aboard. On many ships the general quarters station of the executive officer is in CIC.

PEACETIME RADAR

Air-traffic Control

We may tend to think of radar as a device primarily adapted for war purposes but it can be utilized in peacetime also. Radar devices can picture the entire air traffic of the United States, control that traffic, no matter how complicated, and provide safety features hitherto believed impossible.

Supplementary loran, or long-range navigation scope, which has replaced celestial navigation on long overwater hops of bombers and transport planes is the "Mickey" set that depicts the features of a coastline, discovers obstacles, and otherwise pinpoints the course a pilot must follow.

Used in connection with radar beacons on the ground which are "triggered" to give code responses to the radar search element in the plane, the "Mickey" is accurate to within a few hundred feet at close range.

It is possible that the United States may establish throughout the country a network of 200 new sets which would enable airway traffic controllers at any point to see every plane in their given areas in its exact position at all times. Consequently, a plane's relations can be revealed continuously to all other planes, to obstacles, to bad weather, and to the airports at which it seeks to land.

A screen at any one station can be reproduced at any or all of the other stations or at a central control point for the whole United States. In wartime, this system would enable an air command at home to locate and correlate our own and enemy forces with complete accuracy.

In times of peace, this system would permit a pilot taking off from Boston, for example, to see the entire traffic pattern at New York before he leaves, including clouds and other weather formations useful to his flight plan.

Storm Warnings

British scientists, and Americans are never far behind them, have recently developed a new radar device which warns pilots away from death-trap clouds that could tear planes to pieces. So sensitive is the new device that it measures the size of raindrops as far away as 100 miles. It ignores, however, ordinary and harmless rain-clouds and concentrates on the dangerous cumulo-nimbus clouds.

In them are violent updrafts, which are said to run to several hundred miles per hour, and are capable of crumbling even the strongest planes as they are blown aloft at ferocious speeds.

Aerologists have discovered that the dangerous nature of a cloud increases with the size of raindrops it contains. Even 40 miles away pilots can now be warned with certainty.

CHAPTER 23

SECURITY

INTRODUCTION

General

The word *security*, like many other words, has several meanings. As used in this chapter, however, it has only one meaning: *Safeguarding of classified matter*. The term *classified matter*, as used herein, also has limited and definite significance. It means facts and data that a potential enemy desires to know about our various activities, and includes documents, apparatus, and machinery. No one who wears, or who aspires to wear the naval uniform would knowingly assist a likely enemy in any way. Nevertheless, there have been some regrettable instances in which a future enemy has obtained information simply because those involved did not truly understand and appreciate what constitutes information of interest to a foreign power.

Importance of Information in War

Modern methods of conducting war require the use of a tremendous amount of information. It is stowed away in books, it accumulates in reports, it is gathered by intelligence activities, it is transferred in letters and messages, and it is sifted and organized in the minds of men who are directing the war. Diaries and snapshots kept by tourists as souvenirs of a carefree trip in peaceful years can produce information that is extremely valuable to their government's intelligence agencies in war. Even the information available in a public library becomes meaningful if the enemy has discovered what information the Army and Navy are gathering. An account of tides and weather in a certain location might provide a valuable hint of impending operations even though it had nothing whatever to do with actual combat.

The aim of warfare is to concentrate a superior force at the right place and at the right time. Before this can be done, however, the information necessary to organize and assemble a superior force, to pick the right place, and to select the right time must be concentrated in a few minds. There are few instances in the history of successful engagements where the victor did not obtain in advance the necessary information on which to base his decision. Conversely, disastrous defeats often can be attributed directly to lack of enemy information or the incorrect interpretation of the information available.

The element of surprise is essential to attainment of the goal of warfare. For that reason, information must be protected, every hint of the plans kept secret, and each decision concealed from all except those who need to know.

Security in Peacetime

Following a war, there is very likely to be a dangerous lowering of security barriers. In this matter, we may find it profitable to follow the practice of the Russians and the Nazis prior to World War II. That they well know the value of security in peacetime is demonstrated by the extreme national secrecy they observed in the pre-war years, knowing that it was the only sure countermeasure against mass espionage. Prior to the German invasion, the Russians successfully prevented the leakage of accurate information regarding their strength and preparedness; as a result, their ability to withstand aggression was wholly underestimated by the Nazis.

No accurate news regarding the progress of German rearmament was permitted to leak out of that country. The silence imposed was not limited to the Army and Navy but was extended to all factories working for national defense, with harsh penalties for those who violated secrecy. In those countries where invasion was almost immediately successful, a large part of the invaders' triumph was due to the information available to them in advance, as well as to the failure of the victims to take preventive action against espionage.

Developments in this respect in the past war point out a truth that must never be overlooked: To insure our national security, all who possess classified information must practice absolute secrecy at all times.

Administration of the Security System

The Chief of Naval Operations exercises control over all policies relating to the maintenance of the security of classified matter. Actually, this becomes a basic responsibility of the Chief of Naval Intelligence. However, the Chief of Naval Communications is primarily responsible to the Chief of Naval Operations for the security of all naval communications. In order to provide for the proper indoctrination of all personnel charged with responsibility for safeguarding of classified matter, instructions that are necessary for the proper administration of the security system prescribed by *Navy Regulations* are issued by the Chief of Naval Operations. Current instructions are contained in the *United States Navy Security Manual for Classified Matter*, the *Registered Publications Manual*, and communication publications.

THE ENEMY'S METHODS

Organized Espionage

Most nations, even in peacetime, maintain espionage organizations of varying size and scope for the purpose of ferreting out information regarding potential enemies. The activities of these organizations have always been among the greatest hazards to security.

When the totalitarian powers revolutionized warfare, they cast aside among other things the accepted theories of espionage. According to the new plan, originated by the Japanese and developed by the Nazis, espionage is no longer an undertaking by a relatively few isolated spies attempting to obtain military or naval information from high-ranking officers. It is a mass effort, carried out in all fields—political and cultural, as well as military—by thousands of unimportant people in minor positions. They depend on statistical methods and the slow accumulation of bits of information until the aggregate tells a story. A single hint dropped unconsciously may prove to be an important piece in the jigsaw puzzle the enemy is putting together.

These informers are in large part sympathetic with enemy aims, even though in some cases they have been coerced into service through threats. During a war, their purpose is to obtain and report as much valuable information as possible and to assist the enemy by spreading false reports, committing sabotage, directing invading forces, crippling key industries and utilities, seizing communication centers, and generally cracking defense and undermining morale. To say that they represent, even in peacetime, a serious threat to our nation's security is not an exaggeration.

Data Desired by the Enemy

It may be well to set forth some definite examples of the type and kind of material that a potential enemy expects his agents to obtain. Obviously, information about convoys, ordnance, and airplanes should not be disclosed; most people grasp the significance of such data to a potential enemy. But what so many do not realize is that the enemy is interested in obtaining data which, to the average person, appears to be general and harmless information. Some understanding of the scope of the enemy's interest may be gained from the following questions (taken from official files), the answers to which enemy agents operating in this country during the past war were instructed to obtain:

NAME, RANK, AND SERIAL NUMBER ONLY
The prisoners about to be rescued from a Japanese prison camp had rueful opportunity to practice the rule that the enemy was to know only their names, ranks, and serial numbers.

What is the situation with respect to manufacture of steel plates covered with rubber manufactured by the U. S. Rubber Company? How many sheets of steel and how many sheets of rubber do the plates contain? What is the total thickness of the plates? Is the exterior sheet rubber or is it steel?

What is the daily production of shells by the Bethlehem Steel Corporation?

What foodstuffs, raw material, and machines are being sent to England?

What manufacturing plants are operating branches in Canada, Australia, and New Zealand?

How many American pilots are being turned out monthly by the Army?

What products does the Remington Rand Corporation manufacture in its new plant at Denver?

The answers to all of these questions could be easily brought out in the course of a friendly conversation. The following incident which occurred during World War II demonstrates how easy it is for unthinking persons to disseminate vital information:

A public utility company of an eastern state, apparently motivated only by a desire to gain public goodwill by advertising its war effort, proposed to release some advertising in which was recorded the fact that the company had done much work in connection with the plant expansion of a certain aircraft factory. More specifically, it was pointed out that a new electric substation had been constructed at a certain point, in order to give the company additional electrical facilities. No imagination is required to appreciate the usefulness of this bit of information to an enemy saboteur. In this particular instance, the firm deleted the information when its significance was brought to its attention by the Navy Department.

Here is another set of questions that an enemy agent was undertaking to answer during the past war: What new war material factories are being constructed? Where are these plants located? When will they begin to function or make deliveries?

Apropos of these specific inquiries there comes to mind a United Press war release by a writer who had escaped from occupied territory. In his article, the writer recalls his astonishment at an incident that took place on a train on which he was a passenger.

"Coming into Detroit from the West," he writes, "a group of us who were immersed in reading or chatting were startled when one passenger called out, 'Look! There's that big new bomber plant!' A state highway running near this gigantic midwestern bomber plant had been blocked and detoured. But the helpful passenger made sure that all of us got the only close-up—from the train, which runs closer to the plant than any public road."

The locations of large amounts of military supplies are always matters of interest to enemy agents. The following quotation, drawn from the same source as the incident related above, demonstrates how thoughtless conversation might give the enemy just the information that his country had assigned him to gather:

"Riding from Cincinnati to Cleveland, I was reading a book when the porter called to me, 'Look at those flat-cars loaded with Army stuff!' By looking quickly between the box-cars on the siding we were passing, I could see a long row of Army machinery standing on flat-cars on a more distant siding. A German saboteur probably would have missed them because of the box-cars if he didn't have a helpful porter."

Obviously, the Navy is a potential source of valuable information, and unceasing, systematic attempts to exploit that source may be expected. The methods that may be used are many and varied—planting agents within the Naval Establishment, photographing or stealing classified documents, tapping telephones and telegraph lines, attacking codes and ciphers, analyzing naval radio traffic, and questioning or overhearing naval personnel when off duty. Although bits of information obtained through these means often appear innocuous, they prove to be of real value when subjected to expert, purposeful analysis and combined with other fragments of information from various sources. The necessity for unceasing vigilance and maximum preventive measures on the part of all naval personnel cannot be too strongly stressed.

Proof of Enemy Success

The following cases have been taken from official records of World War II. In many instances it is impossible to say just how the enemy acquired his information, but there is no doubt that much of it was gained from persons who had no intention of helping the foe.

Case 1. A submarine attacking one of our convoys concentrated its torpedoes on two ships in the center. These ships had been assigned their central position in order that they might be afforded maximum protection. The enemy unquestionably knew that these two particular vessels were carrying cargoes of especial military importance.

Case 2. Documents captured on Saipan disclosed the fact that the enemy in the Pacific had assembled very complete and extensive information about the strength and organization of both Army and Navy air forces. The scope of this information indicated

SECURITY OF CONVOY MOVEMENTS MEANS ABSOLUTE SILENCE
A last-minute telephone call home may inform the enemy of the sailing of an entire convoy.

that it had been painstakingly assembled from a variety of sources.

Case 3. One of the strangest stories of enemy intelligence activity involves the captain of a fast cargo ship in the Pacific. He had thought it safe, though contrary to regulations, to cable his sailing date in code to this country. The date was not kept secret, for the ship was torpedoed and the captain was lost, probably not suspecting that it was because of his own carelessness.

Case 4. Several days before the forces that were to land at Salerno departed from Oran, personnel not closely associated with the joint planning staff betrayed an accurate knowledge of the time and place of the landing. Even before the operation plans were received, the executive officer of an LST noticed that the Gulf of Salerno had been marked with a heavy pencil on a chart in the ship's radio room. On being questioned, the radioman volunteered the statement that the information had been imparted to him by another bluejacket attached to the Seabees. It may not have been difficult for the enemy to deduce the destination, and these incidents do not prove that security broke down, but it is a fact that the Fifth Army collided head-on with strong German armored elements deployed along the selected landing beaches. Whether the enemy benefited or not, it is obvious that too many persons knew too much too soon.

While the cases just described cover wartime situations, the principles apply during peacetime as well. There has been considerable relaxing of over-all security for the purposes of economics, reduction in personnel, and general peacetime convenience. However, it is essential that all current security directives be applied as strictly and as conscientiously as if the nation were at war.

If history repeats itself, potential enemies are already gathering information through their organized systems of espionage. Alertness to this probability is always necessary, and relaxation of security measures at any time is nothing short of foolhardy.

Summary of Methods

Security is a means—not an end. Rules that govern security of information are analogous to gunnery safety orders. They do not guarantee protection, and they do not attempt to meet every conceivable situation. The law of diminishing returns limits the control measures that can be employed profitably, but it is possible to obtain a satisfactory degree of secrecy with a minimum of sacrifices.

Security of information is achieved by a variety of practices, precautions, and safeguards which include suitable defensive measures against the following:

1. Capture or salvage of classified matter
2. Theft, espionage, observation, and photography
3. Interception of communication traffic
4. Radio direction finding or tracking
5. Traffic analysis
6. Cryptanalysis
7. Spurious messages and other falsifications of communications
8. Carelessness and laxity of personnel

CLASSIFICATION CATEGORIES

Four Categories

The security classification categories in current use are: top secret, secret, confidential, and restricted. The examples that are given below under the various security classification definitions are for guidance and do not cover all possible situations and items. Several general subjects appear under more than one classification and specific matter connected therewith must be classified according to merit. The content of specific matter is the test for classification. In the text that follows, the words *matter*, *material*, and *information* as used in connection with classification are synonymous.

Top Secret

Definition. Information and material (matter), the security aspect of which is paramount, and the unauthorized disclosure of which would cause exceptionally grave damage to the nation, are classified top secret.

Examples. Following are some examples of matter which normally is graded top secret:

1. War plans and plans or particulars of future major or special operations.

2. Particulars of important dispositions or impending moves of our forces or convoys in connection with (1) above.

3. Very important political documents dealing with such matters as negotiations for alliances and the like.

4. Information as to the methods used or success obtained by our intelligence services and counter-intelligence services which would imperil secret agents.

5. Certain specialized techniques or methods which may be used in future operations, and the identity and composition of certain units, wherever located, which are especially intended for employment of such techniques or methods.

6. Critical information of new and important munitions of war, including approved scientific and technical developments.

7. Important particulars of cryptography and cryptanalysis.

Secret

Definition. Information and material (matter), the unauthorized disclosure of which would endanger national security, cause serious injury to the interests or prestige of the nation, or would be of great advantage to a foreign nation, are classified secret.

Examples. The following are some examples of matter which normally must be classified secret:

1. Particulars of operations in progress.

2. Plans or particulars of operations, or war plans with necessary enclosures thereto, not included under top secret.

3. Instructions regarding the employment of important new munitions of war, including scientific and technical developments.

4. Important improvements to existing munitions of war until accepted for service use including scientific and technical developments.

5. Information relating to new material (matter) of the type described in the above definition of secret.

6. Information of the type described in the above definition, concerning specific quantities of war reserves.

7. Development projects of the type described in the definition above.

8. Information of enemy or potential enemy material, procedure, dispositions, and activities, the value of which depends upon concealing the fact that we possess it.

THE INEXPERIENCED MUST BE CAUTIONED
Replacements in a forward area must be impressed with the need for secrecy.

9. Reports of operations containing information of vital interest to the enemy.

10. Vital military information on important defenses.

11. Adverse reports on general morale affecting major operations.

12. Important cryptographic devices and material (matter) unless assigned to a lower category.

13. In the continental United States those military maps and serial photographs which show vulnerable points or vital installations.

14. In overseas possessions or foreign territories occupied by forces of the United States those military maps and aerial photographs which show the layout of permanent defense works and naval bases, other vulnerable points of vital installations, and the adjacent terrain vital to their defense; and those that serve to fix definitely the location of any element which discloses functioning characteristics of permanent defense works and naval bases.

15. Aerial photographs and negatives of foreign areas when necessary to protect the source or to accord with conditions imposed by the foreign country concerned.

16. Maps, relief maps, charts, and photomaps prepared from aerial photographs or negatives. Such matter will be graded in accordance with the actual details shown thereon, and not necessarily in accordance with the classification of the photographs or negatives used. Classification of aerial photography will be determined by the content thereof and not by

the classification of directives ordering its accomplishment.

17. Information indicating the strength of our troops, air and naval forces, identity or composition of units or quantity of specific items of equipment pertaining thereto in active theaters of operation, except that mailing addresses will include organizational designations.

18. Information on the order of battle of a foreign nation. Such information will be classified according to the means by which it was obtained and the importance of concealing the fact that it is possessed by the United States.

19. New or specialized ships, aircraft, equipage, techniques, or methods to be used in future operations. The identity and composition of units, wherever located, which are especially intended for employment of such techniques or methods.

20. Photographs, negatives, photostats, diagrams, or models of secret matter.

Confidential

Definition. Information and material (matter), the unauthorized disclosure of which would be prejudicial to the interests or prestige of the nation, or would cause unwarranted injury to an individual, or be of advantage to a foreign nation, is classified confidential.

Examples. Some examples of matter normally classified confidential are:

1. Particularly serious matters, investigations, and documents of a personal and disciplinary nature, the knowledge of which it is desirable to safeguard.

2. Routine operational and battle reports which contain information of value but are not of vital interest to the enemy.

3. Routine intelligence reports.

4. Military radio frequency allocations of special significance, or those which are changed at frequent intervals for security reasons.

5. Military call-sign assignments of special significance which are changed at frequent intervals for security reasons.

6. Meteorological information of designated areas.

7. Information which indicates strength of our troops, air and naval forces, identity or composition of units, or quantity of specific items of equipment pertaining thereto in areas adjacent to active theaters of operation.

8. Technical documents and manuals of the type described in the definition above, used for training, maintenance, and inspection of important new munitions of war.

9. General tactical lessons learned as a result of operations which it is desirable to withhold from any foreign nation.

10. Information relating to the design and development of new material and containing information of the type described in the above definition of confidential.

11. Certain legal documents, such as leases, which contain information of local political or financial significance of the type described in the definition above.

12. Cryptographic publications and devices not assigned a different classification.

13. In the continental United States, those military maps and aerial photographs which show the layout of the permanent defense works and naval bases considered important to the defense of the United States, and those that serve to fix definitely the location of any element of such permanent defense works and naval bases. When the complete map of a defense area consists of more than one sheet, only those sheets showing defense elements need be classified confidential.

14. In overseas possessions and foreign territories occupied by the forces of the United States, those military maps and aerial photographs not classified as secret which show military and naval radio stations, air bases, airdromes, air depots, supply bases, arsenals, proving grounds, or any area important to defense.

15. Aerial photographs and negatives of foreign areas when necessary to protect the source or to accord with conditions imposed by the foreign government concerned.

16. Maps, relief maps, charts, and photomaps prepared from aerial photographs or negatives. Such matter will be graded in accordance with the actual details shown thereon, and not necessarily in accordance with the classification of basic photographs or negatives used. Classification of aerial photography will be determined by the content thereof and not by the classification of directives ordering its accomplishment.

17. Technical information of the type described in the definition above, such as of research or processes of manufacture which may be a distinct military asset and not a matter of general knowledge.

18. Information and records compiled at the request of the Navy Department for its use in the assurance

HOW TO COOK A TURKEY IS NOT A SECRET MATTER
But how many turkeys you cook may tell the enemy the strength of forces assembled in an area.

of adequate provision for the mobilization of industrial organizations essential to wartime needs.

19. Information of the type described in the definition above, relative to specific quantities of war reserves.

20. Photographs, negatives, photostats, diagrams, or models of confidential matter.

Restricted

Definition. Information and material (matter), which requires security protection, other than that determined to be top secret, secret, or confidential, is classified restricted.

Examples. A few examples of material normally classified restricted are:

1. Documents of a personal and disciplinary nature, the knowledge of which it is desirable to safeguard.

2. Information indicating the strength of our troops, air and naval forces, identity or composition of units, or the total quantity of specific items or equipment pertaining thereto in areas remote from active theaters of operation.

3. Training and technical documents for official use only or not intended for release to the public.

4. Photographs, negatives, photostats, diagrams, or models of restricted matter.

5. Parts of mobilization plans and regulations of the type described in the above definition of restricted.

6. Documents relating to the design and development of new material of the type described in the definition above.

7. Procurement plans of the type described in the definition above.

8. Cryptographic devices and material of the type described in the definition above.

9. Certain legal documents, such as leases, of local political or financial significance of the type described in the definition above.

10. Documents regarding engineering principles and design details, composition, method of processing or assembling, which are vital to the functioning or use of an article of material.

11. In the continental United States, those military maps and aerial photographs which show military and naval radio stations, air bases, airdromes, air depots, supply bases, and arsenals, considered important to the defense of the United States.

12. During times of active hostilities, photographs and negatives, not otherwise classified, of territory under our or enemy control in or adjacent to active theaters of operation, and of territories under our control remote from active theaters of operation.

13. Maps, relief maps, charts, and photomaps prepared from aerial photographs or negatives. Such matter will be graded in accordance with the actual details shown thereon and not necessarily in accordance with the classification of the photographs or negatives used. Classification of aerial photography will be determined by the content thereof and not by the classification of directives ordering its accomplishment.

14. Compilations of permanently assigned call-signs or allocations of frequencies that are individually unclassified.

Responsibility for Determining Classification

The originator of a new machine, a new device, a message, a letter, a report, or a document of any kind is responsible for labeling it top secret, secret, confidential, or restricted, if it falls within one of the definitions. He must avoid the common tendency toward overclassification. Through the necessary steps of preparing the material, typing or printing, and distribution, the same degree of security is necessary that will be accorded the completed document, letter, or report when it is distributed. Destruction of carbon paper and rough scraps is essential.

Markings of Classified Matter

Documents that are classified bear the category of classification on every page. The classification must appear on the original and on all copies at the top and near the bottom so that the markings will not become covered in assembling.

Except while in the process of local distribution in the custody of persons authorized to handle such matter, top secret, secret, and confidential documents must, while in transit, be placed in double wrappings, or envelopes. The inner covering should be plainly marked or stamped with the classification. The outer covering, bearing the address, should not under any circumstances be marked to indicate the classified nature of the contents.

Special Kinds of Classified Matter

Two types of classified matter, namely registered publications and classified messages, receive somewhat more careful handling than other material of the same classification. Extra precautions are taken to safeguard them.

Registered publications include ciphers, codes, and classified instruction books for apparatus and material. Each copy of such publications has a short title and register number. Accurate accounting and periodic inventories establish the location of each copy at all times. Copies of such publications cannot be made without permission, and most of them are secret or confidential. Handling, transporting, and accounting for them are explained in the *Registered Publications Manual*, which supplements the rules for ordinary classified matter.

Classified messages are almost always encrypted, that is, wrapped up in a cipher or code, or both, before transmission by rapid means. The necessity for encryption of such messages is frequently overlooked both by officer and enlisted personnel.

KEY MAN IN THE SECURITY SYSTEM
Into his ears passes a great amount of classified information. His silence is a matter of great importance.

Messages which are to be encrypted, or exact plain-language transcriptions of encrypted messages must be handled with special care since a single message in the hands of an enemy might make it possible for him to break the code. The number of copies which may be made is therefore severely limited. The code copy and the exact transcription must never be circulated or filed together. Other common-sense precautions should also be taken. This applies as well to paraphrases and approximate transcriptions.

SAFEGUARDING OF CLASSIFIED MATTER

General Requirements

It is imperative that classified matter be safeguarded from compromise. This is accomplished primarily by:

1. Thorough indoctrination of personnel
2. Maintenance of proper custody
3. Thorough destruction when appropriate
4. Limiting accessibility to those who need to know

Each person to whom classified matter is entrusted or made known must protect it against loss or compromise. He is responsible for any act or failure on his part which may in any way contribute to its loss, compromise, or unauthorized disclosure. This includes

THEY HAVE BEEN WARNED
Personnel on shore leave are warned not to talk about military matters.

information which is transmitted orally. Classified matter must not be removed from the ship or station by which it is issued, unless approved by the commanding officer. Classified matter may be released into the personal custody of Reserve personnel in an inactive duty status only when the issuing authority has been assured that facilities are available to the personnel concerned such as will afford physical security to the matter in accordance with current stowage regulations prescribed by the *United States Navy Security Manual for Classified Matter.* Matter for training purposes which is to be studied at home shall normally not be classified above restricted.

Rules for Disclosure

The fact that a man wears the Navy uniform does not entitle him to know Navy secrets. Each one is authorized to know only the things that are necessary in the performance of the particular duties that are assigned to him. When a certain job does not necessitate acquiring information of a confidential or secret character, a conscious effort should be made to avoid coming into possession of such knowledge. What does it profit any member of the Naval Service to acquire classified information that is not essential for the duties of his billet? Seasoned and experienced naval personnel avoid as the plague any classified data that they do not need to know, for they realize only too well that such knowledge in their possession does not advance the interest of the Naval Service and in addition jeopardizes their own personal safety.

In the development of a sound security policy, cognizance must be taken of the fact that practical security must necessarily differ from the ideal of positive secrecy in that modifying factors are involved. After all, information must be disseminated, otherwise it would generally be useless. It cannot be kept within the knowledge of one or two persons. For this reason, the authorized means and methods of disclosing and transmitting classified material have been developed by careful study, involving the lessons learned over a great period of time.

Top secret and secret matter may be disclosed to persons in the Armed Forces or other government services whose official duties require information on the specific subject under consideration and to persons not in the government service only under *exceptional* circumstances when it is determined that they must have information on the specific subject under consideration. In the interests of expeditious handling, more assistants may be authorized to process secret matter than are utilized for top secret matter. Competent authority must *specifically authorize* those who are to receive top secret and secret matter.

Confidential matter may be disclosed to persons in the Armed Services or other government service whose official duties require or make advisable that they have knowledge concerning the specific subject under consideration, or to persons in the Armed Services or other government services, who, in the best interests of the Naval Service, should be informed concerning the specific subject under consideration. Confidential matter may be disclosed to persons not in the government service when it is in the best interests of the Naval Service that they be informed. Competent authority must determine those who are to receive confidential information.

Restricted matter may be disclosed to persons in the Armed Services or other government services except those who are excluded from certain specific information. Restricted matter may be disclosed to persons in the government service whose official duties require the information or when such dissemination appears to be in the public interest. Restricted matter may be disclosed to persons not in the government service when it appears to be in the public interest and has been authorized by competent authority in accordance with current basic policy. Restricted information may be given the widest possible dissemination within the Service or may be limited to those who "need to know." Promulgation instructions must clearly specify the desired dissemination. Information classified as restricted should not be considered as well protected, but it must be handled in such manner as not to become public knowledge.

United States citizens who represent a foreign government or foreign private interest are to be treated as foreigners for purposes of security control unless they are representing the United States Government in so serving a foreign power. Naval Missions are specifically directed with regard to disclosures to the foreign power to which accredited.

Disclosure to General Public

In the interest of national security, classified naval information must not be released to the public. However, classified matter of genuine public interest may be referred to the originator or a responsible higher authority for review. If prudent to do so, such matter may be downgraded in whole or in part by competent authority and the *completely declassified* portion made available to the public. The release or publication, authorized or unauthorized, of specific information on a subject to the press, radio, or other public dissemination activities does not in itself declassify all related information on the same subject. All naval information is classified according to content. Thus operational, technical, and other details which have not been declassified by competent authority are to be safeguarded according to the assigned classification.

The inclusion of classified information in any article, book, speech, or public discussion by a naval member or civilian employee of the Naval Establishment for dissemination outside the Naval Service is prohibited. Persons in the Naval Service who desire to publish unclassified articles on professional, political, or international subjects must cause their signatures to appear on such articles along with a statement to the effect that the opinions or assertions contained therein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large. Immediately upon the acceptance of such articles for publication, the writer must forward a complete copy of such articles to the Secretary of the Navy for the files of the Navy Department. A similar procedure applies to speeches and public discussions, in which cases the individual must inform his listeners of his unofficial status.

Subject to the above requirements, officers and others attached to or employed by the Naval Service are at liberty to publish articles without further permission from higher authority. Upon request, prior to publication or delivery, the Director of Public Relations must obtain technical review and advise authors and speakers of any changes considered necessary from the standpoint of naval security. He must also advise them with regard to over-all government policy. However, in all cases the final responsibility for statements rests upon the individual writer or speaker.

Indiscreet conversation and personal letters constitute the greatest menaces to security. This applies especially to persons inclined to engage in discussion of office affairs with their families or friends outside of the office. It also applies to careless talk in the office in the presence of persons not authorized to have the information. Loose talk in public places and over the telephone is also most dangerous. Information imparted to unauthorized persons within or outside the Service may be repeated innocently and in ignorance of its importance until it becomes a matter of common knowledge. Foreign intelligence agents are scientifically trained to collect and to collate numerous bits of seemingly harmless information from conversation and rumors which circulate in the vicinity of naval activities. False and erroneous information which has been given deliberately may often provide an agent with the needed fragment. Therefore, automatic censorship of official and unofficial conversation and letters must be a fundamental duty of all naval personnel. The habit must be cultivated until it becomes routine.

The necessity for "security at the source" is to be emphasized. Before arrival in port following a period of operations, personnel should be cautioned concerning special or unusual security requirements connected therewith. Braggadocio is costly—sometimes in American lives. What might appear to be harmless, interesting information may be just the type of data that the enemy is striving to gather.

Information for Press Correspondents. Immediately upon the arrival within a command of press correspondents and other representatives of public information activities, the commanding officer should advise them concerning security limitations as affecting the release of information to the public. Their cooperation in the protection of classified information which they may inadvertently obtain should be sought.

Specific Protective Measures

There are in general four ways in which classified information is protected: censorship, physical security, transmission security, and cryptographic security.

Censorship places a barrier between classified information and unauthorized persons by preventing its disclosure in letters, conversations, and personal contacts. It means the shutting off of information at the source, except in making official use of it, and depends to a large extent on the integrity and discretion of the individual. There are two kinds of censorship, personal and official, but only the former will be discussed at this time.

Physical security is concerned with protecting documents, devices, and communication material so that they never fall into the hands of unauthorized persons or come within either optical or camera range of actual or possible enemies.

Transmission security is achieved by reducing to a minimum the information the enemy can obtain from study of our communications, chiefly of our radio traffic, even though he cannot break down our codes and ciphers. Visual transmissions are included, but the limited range of such methods makes the problems comparatively simple.

Cryptographic security is provided by codes and ciphers used in communications and is concerned with proper construction and correct use of codes and ciphers so that they cannot be broken by the enemy.

UPON SECRECY DEPENDS THEIR SAFETY
An LST crew relax before a landing operation on an enemy beach.

PERSONAL CENSORSHIP

When Secrets Slip

There is no way of estimating how many battles have been lost, how many ships have been sunk, how many lives have been sacrificed because someone casually or in a moment of boasting unintentionally betrayed a vital military secret.

In January of 1916, an American businessman in Warsaw was invited to dine at the home of a German military official. The food was excellent, the wine flowed freely, and the barriers of nationality were temporarily forgotten. As the conviviality increased, the officer's tongue loosened, and before the American left he learned that the Germans had scheduled for late February a terrific offensive against Verdun, designed to crush France. The story was passed on to the Allies who reinforced the hitherto weak defenses of Verdun by bringing up additional troops and artillery. The Germans struck on 21 February, but the French guns were ready, and what might have been a decisive blow at France turned into a bloody defeat for Germany — all because of a loose tongue.

A pilot in an English coastal town had for years been steering merchant vessels through the difficult port waters. He boasted to his cronies in a tavern one night of his feat of bringing into port that day the largest ship of his career — a 25,000-ton vessel. That night a squadron of Nazi bombers appeared overhead; docks were destroyed, the loaded ship was sunk, and many lives were lost.

Reticence Is Necessary

There is only one safe conversational policy for naval personnel to follow when on duty: Say nothing about classified matter or information to anyone who is not authorized to know. There is only one safe policy when off duty: Say nothing about the work to anyone, even when in the company of authorized personnel. There are few places where conversation cannot be overheard. It must be remembered that it is human nature to pass on a secret accidentally learned.

Official secrets should not be discussed even with members of one's own family or close friends in whom one has the greatest confidence. Although they would never intentionally reveal classified military information, they might, in ignorance of its importance or forgetting its source, inadvertently mention a detail in casual conversation. To keep the silence, one should, by skillful maneuvering of the conversation or by outright refusal to talk shop, decline to discuss official matters. In many cases, it is desirable to plead ignorance of the subject under discussion. Enthusiasm toward one's work is clearly desirable, but not when it results in a discussion of naval affairs. In the first place such public disclosure of naval matters is in poor taste. Second, and more important, information may possibly be overheard by enemy agents or by individuals who will unwittingly pass along valuable data to them.

Personal censorship extends also to telephone conversations. A naval officer who, in the course of his duties, refers to a message over the telephone by mentioning both the date-time group and the gist of the message endangers not only the information but the cipher as well, if the message was encrypted. An encrypted copy of the dispatch is probably available to the enemy. Telephone wires can be and are tapped. Private lines are less secure than party lines because they are specifically labeled and are therefore easy to locate at junction points in the cables. Conversations may be heard at the switchboard and various other points along the circuit.

Official secrets should not be discussed over the telephone and no such information should be given by phone to a caller whose identity has not been satisfactorily proved. If the caller professes to be an authorized person, but is not positively identified, it may be wise to break off the conversation and call him back on his officially listed extension prior to discussion of professional matters.

Diaries and Letters Help the Enemy

During World War I, a soldier stationed near Sourayville described in a letter to his mother the success of his battalion and the failure of the enemy to locate its position. "The enemy seemed to think we were in a similar clump of woods about 400 yards north of us, for he shelled it heavily several times today," he wrote. He put the letter in his pocket intending to mail it later. But that night he was captured. About an hour later there came a heavy concentration of enemy fire on the clump of woods in which his battalion was located. The information contained in the captured letter had enabled the enemy to correct its previous error, with the result that over a hundred of his fellow soldiers were killed and more than that number wounded.

Dangerous indeed is the temptation to jot down in personal notebooks the events that occur or interesting bits of information that will provide entertaining conversational matter after the war. Diaries of prisoners are fruitful sources of information for the enemy.

PHYSICAL SAFEGUARDING

Protection

Knowledge of classified communication systems and information can be a dangerous possession. That is why only a limited number of naval personnel are authorized to handle and use classified matter. The loyalty of other personnel is seldom questioned; but if they have no classified information, the chances of such information falling into the hands of outsiders are greatly lessened.

The first obligation of officers or enlisted men working with classified matter is to protect that matter from being seen by any unauthorized individual, either military or civilian. There is no reason for persons not concerned with classified matter to have access to it until it becomes necessary to do so to discharge their duties properly.

Restricting the distribution of classified material is necessary to prevent any thoughtless disclosure of information which might lead to capture.

Secret or confidential material should neither be removed from its designated working space nor left unguarded. When not actually in use, it is kept locked in the proper accommodation, for a single glance at a message or a cryptographic aid may be enough to betray the system. Another danger is that a photograph could be taken in a split second with a concealed camera. Classified materials are not subject to the same hazards on shipboard as on land. Even in event of the capture or crippling of a ship, these materials are not likely to fall into the hands of the enemy except through carelessness.

When a code or cipher is captured, not only is the key available for deciphering current and past messages, but the basic style and structure of the system are so apparent that enemy cryptanalysts are greatly aided in breaking similar systems.

The materials and methods used to prepare classified messages or other matter are potentially just as dangerous as the actual messages. Rough drafts and notes must be written on single sheets placed on hard surfaces to avoid impressions which might be made clear by chemical treatment and photography. Words on stencils, cushion sheets, carbon paper, desk blotters, and backing sheets are almost as legible as the original. For this reason, the same care and stowage should be given materials and supplies used for classified matter as are given to the matter itself.

Destruction

When classified materials are no longer useful, they are destroyed under supervision, never discarded in wastebaskets for ordinary disposal. If immediate destruction is not feasible, work sheets and notes should be torn and stored in a safe or a guarded "burn bag" until they can be destroyed. The communication officer always provides a detailed destruction bill for the destruction of all classified matter in the event his ship is captured or sunk. This bill will show the responsibility of personnel by duty rather than by name and will give the order in which publications and apparatus are to be destroyed. Sinking classified material at sea in weighted bags is satisfactory in deep water; but it is not practical in shallow water or near the shore. Secret publications are destroyed before confidential and restricted matter; but *Reserve on Board* material (documents and devices not yet made effective) should be destroyed before effective documents and devices of comparable classification. Ordinarily, destruction by fire is preferred.

Restricted apparatus and equipment are destroyed beyond repair. Secret and confidential equipment is destroyed beyond recognition. If time does not permit communication with the commanding officer, every person concerned must act on his own initiative.

Whenever evidence is received that a code or cipher may have been broken or captured by the enemy, the system is discontinued and outstanding publications devoted to it are destroyed. Continued use of the compromised system may result in defeat. Therefore, whenever anyone uncovers evidence that unauthorized personnel have had access to classified matter or that a system may have been otherwise compromised, he must report the details promptly. In event of the loss of a ship, it is essential that the Navy Department immediately be given full details of the disposal of classified matter in general, and cryptographic systems and publications in particular. This report is prepared by the senior survivor.

TRANSMISSION SECURITY

Relative Security of Transmission Methods

Any time a message leaves the hands of an originator and is sent on its way to the addressees, it is *transmitted.* Whether it goes by courier, radio, visually, by mail, or carrier pigeon, it has to be safeguarded in its transmission. The means of protection may be different but the purpose in each case is the same: to keep that message out of the hands of those not authorized to receive it.

Transmission security is that condition which results from all measures designed to protect transmissions from interception and traffic analysis. The relative security of one means of transmission over another varies according to circumstances. Inasmuch as every transmission is subject to interception, protective measures must be taken to reduce to a minimum the information gained by unauthorized persons.

The means of transmission in the approximate order of security are as follows:

1. Messenger
2. Registered mail—military, United States postal, or diplomatic pouch
3. Ordinary mail—military or United States postal
4. Approved wire circuits
5. Nonapproved wire circuits
6. Visual means
7. Sound systems
8. Radio

The only possible way to obtain absolute transmission security is to refrain from all communications over an extended period. This applies particularly to radio, and that of course is sometimes impossible. Messages have to be sent and communications established to prosecute any type of operation.

Use of the less exposed methods tends to reduce the amount of traffic available to an interceptor for cryptanalytical study.

An officer messenger is the most secure means of delivering a document. When a messenger is carrying classified material, he carries it personally at all times. He is armed, and the safety of the material is his paramount responsibility.

Classification permitting, the United States Mail Service does very well, for it is a dependable and secure method. A letter will travel several hundred to a thousand miles a day. Dependable overnight service can usually be depended upon within a radius of 200 or 300 miles. Airmail gives the same satisfactory service over a larger area if the schedules are taken into consideration.

At sea, sending messages by dispatch boat and visual means is preferable to radio. Boat service is the most reliable of these and can be carried out with considerable speed. Visual methods are more secure than radio and ease the load which is usually imposed on radio, even though they, too, often become overloaded.

Wire Systems

Wire systems include telephone, telegraph, teletypewriter, and facsimile. They are grouped into two categories: approved and nonapproved circuits. Approved circuits are designated by appropriate command under regulations laid down by joint policy. The classification of messages that may be transmitted in the clear over an approved circuit is dependent upon the classification rating of the circuit. Electrical circuits are not approved for transmission in the clear of any traffic having a classification higher than secret. Circuits not approved by appropriate command in accordance with joint policy, or those linked by radio, are termed nonapproved circuits.

Classified information is not transmitted in the clear over nonapproved circuits except when a transmission is too urgent to wait for encryption, and when the speed of delivery is more important than the value of the information to the enemy. Wire communication offers greater security than radio and should be used in preference to radio whenever practicable.

Radio is the most used, the most consistently overloaded, and the least secure means of all. Each message sent by radio is open to reception by any friend or enemy who has the necessary equipment and is within the reception range. Of course, there is no

RADIO SILENCE IS OFTEN IMPERATIVE
This Japanese aircraft may have located the carrier force through alert interpretation of a radio message.

alternative when at sea unless the message can wait; but in port or at shore stations, even transmission by mail will frequently suffice.

The use of radio has advanced to a point where it has become the prime means of electronic communication. This has a profound effect upon communication security. The speed, range, and versatility of radio have enabled communications to keep pace with the mobility of modern warfare. But the use of radio has also exposed communications to their greatest danger. The mere fact that a radio station is on the air is a source of information to the enemy. Intercept stations and direction finders enable the enemy to record a large portion of the transmissions in order to determine where they are made. This gives him an opportunity to follow troop movements and to learn the identity, strength, plan, or tactical disposition of a military force. A single electrical impulse can indicate the existence of a unit.

A particular and separate emphasis must be placed on the proper use of radiotelephone. Overuse and carelessness are two faults that may accompany voice transmission.

The mistaken idea that voice radio transmissions are more secure than keyed transmissions is one of the most treacherous illusions in the files of electronic communication. Voice transmissions on any frequency are, in reality, less secure than keyed transmissions on the same frequency because anyone can understand them — without knowing the telegraphic code.

VHF/UHF (very high frequency/ultra high frequency) and SHF (super high frequency) designate specific bands that are employed for the very reason that their normal range is limited roughly to "line of sight." The line of sight rule means considerably more than is generally thought. Consider an airplane at 30,000 feet. It has a line of sight of 200 miles. Many instances have been recorded of verified reception by surface vessels of VHF reception at distances of several thousand miles. Thus, even though higher frequency bands normally provide more limited range characteristics than the lower frequencies, they are not secure enough to justify use of plain language for messages which on lower frequencies would have to be encrypted.

The fact that radio is the least secure of the means used for transmitting messages makes it necessary for anyone using radiotelephone to be thoroughly versed in radiotelephone procedure. *JANAP 125*, the instruction book on radiotelephone procedure, has been formulated to insure brief, definite, and uniform language. In the interests of security, no variations, elaborations or short cuts on the prescribed procedure should be attempted.

Cryptosecurity

For almost as long as man has possessed the ability to write, he has also been able to disguise his writing so that only those knowing his system can understand it. Today, one of the most important phases of communication is cloaking what you wish to say under the wraps of a code or cipher. The standard term for this technique is *cryptography*.

Both code and cipher are systems of cryptography. Code encryption is obtained by applying the arbitrary substitution of entire words, phrases, or even complete sentences of the plain text. Cipher is obtained by generating a system of alteration of letters of the plain text, and thus a set of substitutions is derived without reference to an arbitrarily fixed list of substitutions.

The apex of cryptosecurity is when the originator can convey his *unobscured thought to only the proper addressees.*

Certain of our cryptosystems offer the ultimate in military communication today. Other systems have a lower degree of security and are used only for designated and limited purposes. All cryptosystems convert classified messages to a form intelligible only to the person holding the key. The safekeeping of all these cryptomethods, systems, and devices is as necessary in peacetime as in war. Cryptanalytic attacks spread over several years are more likely to succeed than attacks limited to a few months. *Never assume that any system is unbreakable.*

The communication officer sets forth instructions on how to prepare messages for transmission. Personnel concerned are responsible for their careful handling.

It is an absolute requirement that all persons handling classified messages or translations of encrypted messages be actively aware of the potential danger of disclosing classified information. (Further information on this subject is available in *United States Navy Regulations, 1948*, Chapter 15, and the *United States Navy Security Manual for Classified Matter.*)

CHAPTER 24

NAVAL INTELLIGENCE

INTRODUCTION

Definitions

Our purpose in this chapter is to define certain terms commonly used in naval intelligence work, briefly to orient the reader with regard to the place occupied by Naval Intelligence in the Navy, to present an account of its origin and development, and to describe its present mission and organization. Our discussion falls into three main parts: Introduction, Origin and Development of Naval Intelligence, Organization of Naval Intelligence.

The subject of this chapter is *Naval Intelligence.* This term, when capitalized as indicated, means the organization which, under the Chief of Naval Intelligence, is responsible for and carries out the intelligence mission of the Navy. Naval Intelligence includes the Office of Naval Intelligence, naval intelligence officers on foreign posts, the naval district intelligence organization, and the intelligence units of the Operating Forces.

When used as an abstract noun to designate the material obtained, processed, and disseminated to appropriate naval authority, the term *naval intelligence* is spelled in small letters, as indicated.

The Navy is one of three co-equal departments within the National Military Establishment, and the intelligence collected by it for its specialized use is *departmental intelligence*, which should be distinguished from *national intelligence.* The Central Intelligence Agency, which is the intelligence unit of the National Security Council (see Chapter 9), is concerned with national intelligence; the organization known as Naval Intelligence is concerned with naval intelligence, or, to phrase it differently, *intelligence of naval interest.*

At this point a distinction should also be made between *information* and *intelligence.* The former is the raw material and the latter is the finished product. Information becomes intelligence while being or after being subjected to *the intelligence process.*

The intelligence process consists of three major steps, which are, in order, collection, processing, and dissemination.

All intelligence bureaus undertake these three basic steps, whatever they may call them. The second step is called *evaluation* by some agencies, but Naval Intelligence considers evaluation to be merely one aspect of processing which in turn is the second step in the intelligence process.

Collection of information takes place 24 hours a day all over the world. Naval Intelligence is primarily concerned with collecting information of naval interest, and to this end it tirelessly and systematically employs its nation-wide and world-wide networks of specialists. Information thus collected flows to the Navy Department, where the second step, processing, takes place.

By and large, collection is a field activity, although much of it is done at headquarters. Processing is chiefly a function of the Office of Naval Intelligence (ONI) from which the finished intelligence is disseminated to the field. An item of information collected, for example, by a naval attache abroad, may receive partial processing, or preliminary evaluation before being submitted to the Chief of Naval Intelligence in Washington.

Information is collected from a *source,* and the reliability of many sources is naturally open to question. Without going into too much detail, we can say here that during the *processing* step a given item of information undergoes an elaborate series of tests and analyses designed to reveal its inherent worth and significance, and the trustworthiness of the source from which it emanated. When processing has been completed, the item becomes intelligence and is ready to be disseminated.

The third step in the intelligence process, *dissemination,* means conveying the finished intelligence in the shortest possible time to those individuals in the Naval Establishment, ashore or afloat, who need it for the formulation of plans and policies or the conduct of operations. Intelligence is disseminated by such means as oral briefing, written letters or reports, published monographs or studies, and through graphic media.

All naval operations, from peacetime training exercises to the deployment of major fleet units under war conditions, require for successful execution a continuous flow of accurate, timely, and complete naval intelligence. This has been true since the time of the earliest recorded sea battles. Many thousands of Army, Navy, and Marine Corps veterans are alive today because the intelligence which was desperately needed at some point in World War II, in one or another combat zone, came through in time and in understandable and usable form.

The finished product of the intelligence process may be termed either *counter-intelligence* or *positive intelligence.* Positive intelligence is further divided into *strategic intelligence* or *operational intelligence.*

The key to the meaning of strategic intelligence and operational intelligence lies in the respective adjective, which denotes the use to which the item in question is to be put, or the need which it fulfills. Strategic intelligence is used and needed by those who are charged with strategic planning, and operational intelligence is used and needed by those who conduct tactical operations. Both are vital in wartime; after the cessation of hostilities, strategic intelligence becomes relatively more important, because more time is available in which to analyze the capabilities of all nations, including their armed forces, terrain, and political, economic, and industrial potentials.

It is not possible to draw a hard-and-fast line between strategic intelligence and operational intelligence, or between counter-intelligence and positive intelligence, any more than it is possible to distinguish definitely between *strategy* and *tactics.* The same intelligence item may be put to strategic or operational use, or it may serve strategic and operational purposes concurrently, just as a naval engagement has both strategic and operational aspects. Furthermore, an item which may be strategic intelligence at a high level of command may be operational intelligence at a lower or tactical level.

Strategy has been defined as the art of war, and tactics as the art of battle, but war and battle differ only in scope and degree. Battle is localized war, and war is generalized battle. Strategic and operational intelligence overlap, as do war and battle.

The other distinction that is frequently made in intelligence work — for purposes of convenient classification — is that between positive intelligence and counter-intelligence. It is not enough for a nation actively and aggressively to collect positive foreign intelligence about enemy nations in time of peace; it must at the same time protect its own military secrets from the prying eyes of the espionage agents of other powers. Positive foreign intelligence of naval interest consists of data concerning the fleets, naval shore establishments, harbors, and coastlines of other countries, to name but a few subjects. Naval counter-intelligence is charged with preserving the security of our own Naval Establishment and of naval information. Security of naval information has already been discussed in this book.

Thus far in this chapter we have briefly defined these terms: Naval Intelligence, the organization, and naval intelligence, or intelligence of naval interest with which the organization is concerned; national intelligence and departmental intelligence; the intelligence process, in which information is converted into intelligence; strategic intelligence and strategy, and operational intelligence and tactics; and positive intelligence and counter-intelligence, with their respective aggressive and defensive functions. We turn now to naval policy, and to the principal channels of command and administrative control, in locating Naval

JAP DIVE BOMBERS WARMING UP TO HIT PEARL HARBOR
Intelligence studies and evaluates a Japanese moving picture purporting to show planes on carrier in initial phase of sneak attack.

Intelligence within the larger framework of the Naval Establishment.

Naval Command and Administration

An understanding of naval command relationships and of the broad outlines of the executive administration of the Naval Establishment is necessary prior to a more specific discussion of Naval Intelligence. The United States possesses not only the largest and most modern but the best-administered and most efficient Navy in the world. Efficiency requires exact allocation of responsibility and clear delineation of the chain of command. Naval Intelligence no less than any other important component part of the Naval Establishment is assigned definite missions, objectives, and tasks and is subject to higher authority.

The civilian head of the Naval Establishment is the Secretary of the Navy, who is responsible to the President through the Secretary of Defense. He is a member of the National Security Council, the main function of which is to advise the President with respect to the integration of domestic, foreign, and military policies relating to the national security. We have stated above that the National Security Council has its own intelligence unit — the Central Intelligence Agency. The senior naval officer in the Navy is the Chief of Naval Operations. He is a member of the Joint Chiefs of Staff, who are the principal military advisers to the President and the Secretary of Defense.

ONI, though directly under DCNO (Operations), may be regarded as the Intelligence Section of the staff of the Chief of Naval Operations, and the Chief of Naval Intelligence as the Intelligence Officer on that staff.

Military Information Policy of the Navy

The basic policy of the United States Navy was stated in SECNAV letter of 23 January 1947. That letter also promulgated certain supporting and subsidiary policies, among which we find the military information policy of the Navy. Pertinent excerpts from that policy follow:

> 1. To acquire accurate intelligence, in cooperation with other agencies of the Government, both civil and military, concerning the political, military, naval, economic, health, technical, and industrial policies and activities of all foreign countries.
> 2. To analyze and preserve military information for ready reference and for historical purposes.
> 3. To disseminate useful military information systematically throughout the Naval Service and to other government departments and agencies.
> 4. To provide proper security for military information and protection against espionage and sabotage, in cooperation with other departments and agencies.

Paragraph 1 stresses the first step in the intelligence process — collection — and lists some of the main categories of strategic intelligence. It states that such collection is to be done in cooperation with other agencies of the Government, and that the intelligence so acquired is to be accurate. All foreign countries are included in the positive foreign intelligence program of Naval Intelligence.

Paragraph 2 refers to processing — the second step in the intelligence process—and to the preservation of military information for ready reference and for historical purposes — filing. The term "military information" as used here is synonymous with intelligence.

The third step in the intelligence process — dissemination — is the subject of paragraph 3, which states that useful military information shall be systematically disseminated not only throughout the Naval Service but to other government departments and agencies.

The defensive, or counter-intelligence aspect of the Naval Intelligence policy is mentioned in paragraph 4, which states that security and protection are to be provided in cooperation with other departments and agencies.

Cooperation with other government departments and agencies is specifically referred to in paragraphs 1, 3, and 4 above. One of the lessons learned in the last world conflict was that smoothly functioning joint and liaison intelligence activities are vital to the successful prosecution of modern war.

The *mission* of Naval Intelligence, which is derived from the military information policy of the Navy is to administer, operate, and maintain Naval Intelligence in order to provide intelligence necessary for operations and war plans and in order to keep responsible naval authorities informed of the war capabilities and intentions of foreign nations; and of situations or trends threatening the security of the Naval Establishment.

ORIGIN AND DEVELOPMENT OF NAVAL INTELLIGENCE

Naval Intelligence Before World War II

A brief history of the Office of Naval Intelligence is here presented to give perspective to our discussion of the broadened scope and new techniques and developments of Naval Intelligence in World War II and its present importance.

The Office of Naval Intelligence was created 23 March 1882. In that year, the Secretary of the Navy stated in his annual report that "an office of intelligence has been organized for the purpose of systematizing the collection and classification of information . . . in relation to the strength and resources of foreign navies."

In order to carry out the announced purpose of collecting and classifying such information, the naval attache system was inaugurated. At about the time when ONI was established, the "new Navy" of steel ships was being created. The Navy Department was vitally interested in obtaining up-to-date and accurate information on steel ship construction abroad; it was the job of the attaches to collect and forward this information.

Naval Intelligence, no less than the Naval Establishment of which it is a part, has, over the years, been hampered by inadequacy of funds in time of peace. The tendency in democratic countries in the

IT TAKES INTELLIGENCE TO KEEP OLD GLORY ON TOP
Careful gathering and analysis of information enables this United States submarine to display proof of its accomplishments: The large flag indicates a major Jap ship sunk; the small white flags testify to merchant ships scratched.

past has been to allow the Armed Forces to sink to a deplorable state of inadequacy when the sea of international relations is calm, and to rush frantically to build them up when a storm threatens national interests or after it breaks. Aside from a gradual increase in the number of attaches ordered abroad, the growth of ONI has occurred principally in time of war.

Strained relations between the United States and Spain resulted from the Cuban Rebellion of 1895. From this time until the war with Spain was declared in 1898, the Office of Naval Intelligence prepared special data on the strength and disposition of the Spanish Navy and shore installations. After the outbreak of hostilities, a number of vessels were purchased through ONI in foreign capitals for the United States Fleet. Naval attaches, in addition to buying ships and war materials, kept close track of the movements of the squadrons of Admirals Cervera and Camera. Information was furnished by ONI to the Naval War Board, which was charged with preparing strategic war plans and advising the Secretary of the Navy on the conduct of the war with Spain.

In 1899, Congress authorized appropriations for ONI, which for 17 years had been carrying on its work with a small clerical force borrowed from other offices in the Navy Department. According to the annual report of the Secretary of the Navy for 1900, there were only seven officers attached to ONI at that time.

In 1909, the Navy Department was reorganized by executive order. Four aides to the Secretary of the Navy were appointed, one each for operations, personnel, material, and inspections. The aide for operations had cognizance over ONI. In March 1915 a Chief of Naval Operations was created by law, and ONI was assigned to his office.

At the outbreak of World War I, ONI consisted of eight officers and ten civilians. In 1915, a War Information Service was begun on a small scale; this activity was expanded the following year when the Naval Appropriation Bill approved by Congress provided ONI with specific funds for obtaining information at home and abroad.

When the United States entered the war in 1917, Naval Intelligence was prepared, with a greatly expanded organization, to carry out its dual mission of safeguarding the Naval Establishment at home and acquiring intelligence on foreign powers through naval attaches and from other sources.

Aides for information were assigned to the admiral in command of each of the naval districts. The duties of these aides corresponded with the duties of the district intelligence officers during World War II. Working in close cooperation with ONI, they were responsible for investigations, inspections, and censorship, among other duties, in the naval districts to which they were assigned.

Branch offices of ONI were established in several cities, and they reported directly to Washington. They had cognizance over work which was not appropriate to the aides for information.

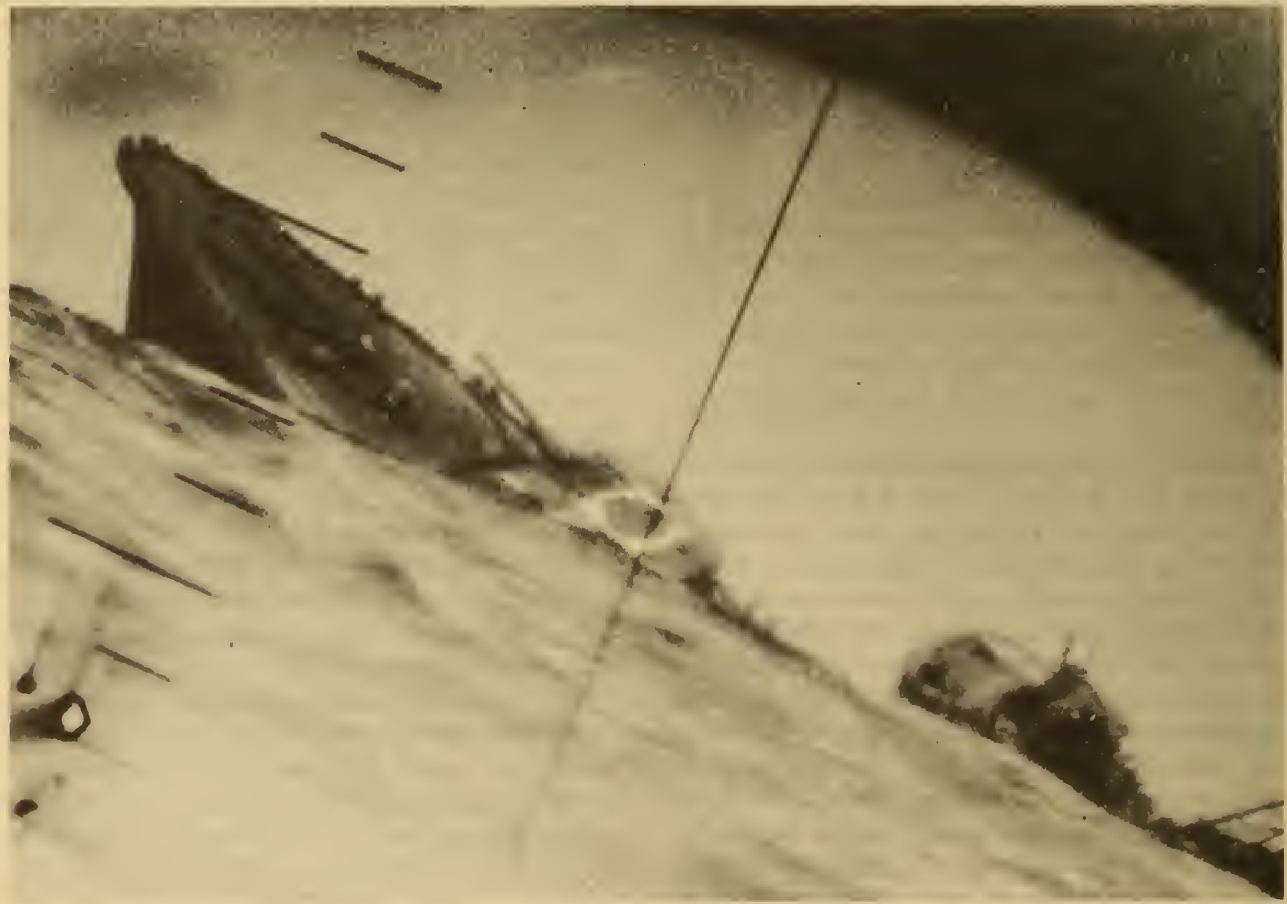
Close and cordial relationships between ONI and other government departments and agencies were established during World War I, and liaison was also maintained with the intelligence bureaus of the Allied powers. Because much intelligence about the enemy was made available by the Allies, the principal contribution of Naval Intelligence in World War I was its work in counter-intelligence on the home front. By helping to preserve the security of American ships carrying troops and supplies across the Atlantic, and by guarding the freight terminals, warehouses, docks, and other places at which war material was concentrated, and the factories in which it was produced, Naval Intelligence did much to insure victory for the Allied cause.

Naval Intelligence in World War II

Just as the armed forces of a nation reflect national characteristics, resources, and the state of its technological development, so do its intelligence services reflect the character and condition of its armed forces. Thinking in intelligence circles will be as bold and original, or as hidebound and conservative, as thinking in military circles generally.

Both the scope and the speed of warfare were tremendously expanded in World War II. More nations were involved, over a greater area of the globe, and a greater variety of weapons, implements, and types of equipment was employed than in any other war in history. Scientific improvement of the tools of war called for innovations in tactics and strategy, and original ideas on high planning levels were implemented by specific research and development, as, for example, in the landing craft program of the United States Navy, or in the submarine program of the Germany Navy.

The drama of weapon versus counter-weapon continued with ever-increasing tempo, month after month, year after year, until the most spectacular new weapon of all, the atomic bomb, was released over Japan. The contest did not end with the cessation of hostilities;



INTELLIGENCE CAN USE A PICTURE LIKE THIS
A torpedoed destroyer sinking is photographed through a United States submarine periscope. Such photographs of enemy craft are valuable in keeping us informed on new developments. Note the Jap insigne on the gunhouse to the left.

major powers continue their research and development programs today.

During World War II, changes in techniques and developments took place in the field of intelligence as well as in weapons, implements, and equipments. No less than total intelligence would suffice for total war. Total intelligence in support of grand strategy was the goal of Hitler, who derived his ideas on the importance of economic, political, and psychological factors from the writings of Walter Nicolai, Chief of the German Intelligence Service in World War I. Hitler achieved initial spectacular success by means of his world-wide Nazi espionage network, his Fifth Column, his alternately whining and bullying propaganda, but these successes were later overshadowed by strategic blunders caused in part by faulty intelligence. Just so, the coup of the Japanese at Pearl Harbor and their rapid conquest of large areas in Southeast Asia in the following months were overshadowed by major strategic blunders in their later conduct of the war.

Conversely, American intelligence methods improved as the war progressed, while the Allied powers welded their invincible grand strategy. It is a truism that foreign intelligence should be collected in peace when many normal overt sources may be tapped. The country that waits until war breaks out has to acquire its foreign intelligence the hard way — by use of covert methods, employment of agents, aerial photo reconnaissance, interrogation of prisoners of war, and processing of captured documents. Because we had been caught unprepared, we were forced to do it the hard way.

A function of intelligence is to give those who use it extraordinary perception — the ability to see beyond the horizon in terms of space, and into the future. Both the capabilities and the intentions of the enemy must be correctly assessed by the commander.

Subsequent to the disaster at Pearl Harbor, our intelligence services did an outstandingly successful job, in close cooperation with the Federal Bureau of Investigation, other government departments and agencies, and Allied intelligence services. Their success was cumulative, as was the success of Allied arms around the globe. Cooperation and coordination on high strategic levels, notably between the United States Army and Navy and between the Americans and the British, were paralleled by joint intelligence achievements on all echelons.

World War II was similar to World War I in that large land armies were locked in struggle on the continent of Europe, but it differed in that air power was employed to an extent inconceivable 20 or 30 years ago.

Aviation developments revolutionized strategy, tactics, and weapons in the armies and navies of all the belligerents in all theaters of war. How the traditional concept of sea power was affected has been well stated by Fleet Admiral Chester W. Nimitz:

> Up to this war, sea power was synonymous with surface ships bristling with guns. Today, and for tomorrow, sea power has taken on new dimensions. It has dived below the surface. It has taken wings. Therefore, I prefer to modernize sea power by making a hybrid of it. Sea-air power conveys the meaning more exactly. . . . Sea power and air power, interdependent and interwoven, provide our carrier-borne fighting planes with a range of 15,000 miles with fuel tanks full and a maximum cargo of ammunition. Sea-borne air power enables our ships to see over the horizon. Sea-borne air power hit the Japanese invading forces in the Coral Sea and at Midway before the ships of the opposing forces could sight one another. Sea-borne air power, vigorous and at peak efficiency, victorious in the last war, may well prevent the next war.

The sea air power of which Admiral Nimitz speaks was the stellar performer in a great tri-elemental advance, composed of Army, Navy, and Marine forces across the Pacific. Logistics miracles overcame the hitherto insuperable handicap of ever-extending lines of communication and supply. An increasing flow of new ships, aircraft, and weapons gave our forces the power and mobility which were needed to wrest the initiative from the Japanese.

Power and mobility are of no use unless effectively employed, and they cannot be so employed unless adequate intelligence is available both to top strategic planners and to commanders in operational areas. The contributions of Naval Intelligence to the Pacific war were so extensive and varied that they can only be touched on here. The details of some of its operations are still veiled in secrecy. We can, however, present the subject in broad outline.

L-4 GRASSHOPPERS AND L-5 SENTINELS HAVE KEEN EYES
Unarmed, these planes observe the effects of our gunfire and report enemy gun emplacements and troop movements to Intelligence.

There was urgent and continuing need for air intelligence on the part of all our forces. Beginning in February 1942, large numbers of Reserve officers were trained in this specialty at the Air Combat Intelligence School at Quonset Point, Rhode Island, and as quickly as possible were rushed out to the Fleet. During World War II, they served with all Navy squadrons, afloat and ashore, and overseas at Intelligence Centers. Expert in such subjects as intelligence procedure, plane and ship recognition, sources of intelligence material, navigation, fundamentals of air tactics, aerology, and geography, they proved to be invaluable additions to all naval aviation components.

The primary responsibilities of the air combat intelligence officer in operational areas were to provide adequate intelligence materials, to help in the briefing of fliers for combat missions, and to interrogate them afterwards. With specially trained photo interpreters, they pored over photographs brought back from the engagement or strike, in an effort to learn as much as possible about enemy antiaircraft positions and other installations. In briefing fliers for attacks on specific targets, the intelligence officers used not only photographs but scale target models turned out by expert model makers either on the carrier or at the air base.

Air technical intelligence officers who had received specialized instruction in plane construction served on crash intelligence teams in combat areas. They recovered enemy planes which had been shot down, and spotted new engines, changes in armament and armor, shifts in the location of fuel tanks, development of new instruments for night flying, and improvements in design. They submitted to headquarters detailed reports on their discoveries and shipped parts, engines, and even whole planes, back to rear areas for testing. The resulting intelligence was disseminated as quickly as possible to our fliers who were thus provided with an accurate analysis of the capabilities of the new types of enemy aircraft they were likely to encounter. When enemy airfields were captured, air technical intelligence officers were among the first troops on the scene.

Outstanding among the several Joint Army-Navy Intelligence Centers established in the Pacific was JICPOA (Joint Intelligence Center, Pacific Ocean Area), at Hawaii, where experts were assigned various exacting duties connected with the processing of information and the preparation and dissemination of finished intelligence directly to commanders in the field. Smaller Intelligence Centers were located at even more advanced bases, where, in the early part of the war, they met and overcame logistics, reproduction, and communication difficulties.

Many charts of the central and southwest Pacific were inaccurate or incomplete because they were based on British hydrographic findings of a hundred years ago. In the north Pacific, the old Russian charts were also deceptive. Units of the United States Coast and Geodetic Survey went along with the most advanced elements of the fleet and provided accurate information on reefs, harbors, and shore lines.

Underwater demolition teams were trained for the hazardous task of clearing obstacles from enemy beaches in advance of amphibious operations. In addition to this work they were used for reconnaissance; information thus acquired was vital to planning.

The U-boat war in the Atlantic was a desperate struggle in which the initial advantage lay with Germany. In 1942, the Nazi submarines were sinking Allied merchant ships at an alarming rate, but new weapons and tactics employed with deadly effectiveness by the specially created Tenth Fleet under Admiral Ernest J. King turned the tide in our favor. Technical intelligence played an important part in the victory of the United States Navy over the German U-boats.

The very heart of the American combat vessel was the combat information center, or radar plot room, which provided up-to-the-minute operational intelligence needed for fighting the ship. Day and night and in all kinds of weather the radar sensitively recorded the range and bearing of own and enemy surface units and aircraft.

Perhaps the outstanding development in intelligence during World War II was the employment of new scientific techniques and methods. Naval Intelligence operated at a deliberate pace in the Spanish-American war, in keeping with the slow speed of the big steel ships which had only recently been added to our Navy. The naval aspect of World War I is also symbolized by the majestic ships of the line, proceeding at the same slow pace but aided by electronic communications. The naval aspect of World War II is symbolized by the fast carrier task force raiding deep into enemy waters and shooting down as many as 400 hostile aircraft in one day.

Naval intelligence obtained through reconnaissance by naval aircraft changed grand strategic plans almost

BEFORE THE STRIKE—ALERT AND TENSE
In ready room, fliers, briefed about hazards involved in a Pacific strike, listen to loudspeaker amplifying voices of bomber pilots on interplane system.

ALL OUR PLANES SAFE—RELAX
But it will soon be their turn to tell Intelligence what they see over the target.

LEATHERNECKS ARE BRAVE—AND BRIEFED

Marines, briefed on Japanese maneuvers, weapons, and psychology by Intelligence, know what to expect in enemy territory.

overnight; for example, when Admiral Halsey found Japanese defenses and facilities in the central Philippines to be a hollow shell, he persuaded higher authorities to cancel the planned invasion of Manila and to invade Leyte instead. It has been estimated that the new plan, successfully executed, shortened the Pacific war by at least two months. This change in grand strategy would not have been possible without new techniques in aerial photo reconnaissance, including Sonne strip photography and underwater depth determination; and rapid and secure communications among the Third Fleet at sea, CinCPac and ComSoWesPac at their respective headquarters, and President Roosevelt and Prime Minister Churchill then in session with the Joint Chiefs of Staff at Quebec.

Present Importance of Naval Intelligence

It is a matter of historical fact that the post-World War II period has been a time of marked international tension. Now, more than ever, is it essential that United States interests be upheld, and that the security of the nation be maintained by a strong military establishment, including a national intelligence service capable of keeping our Government informed of the capabilities and intentions of all foreign powers. Our Navy is one important component of the National Military Establishment; specialized departmental intelligence is required to keep it in an effective state of readiness. Pending possible future delegations of portions of the sovereignty and armed strength of all countries to the United Nations, and the achievement of a workable system of settling international disputes by law instead of by force, the United States depends for its survival on its ability to apply force with overwhelming effectiveness and on short notice. The pace of war is no longer the pace of the dreadnoughts of World War I or even of the superdreadnoughts and fast carrier task forces of World War II; it is rather the pace of the guided missile and the jet-propelled bomber.

Traditional concepts of naval power are currently being revised in the light of new weapons, chief of which is the atomic bomb; and traditional concepts of naval intelligence are being revised accordingly. The peacetime training of naval intelligence officers is being undertaken on a scale never before attempted. In addition to the training given to the officers of the Naval Reserve referred to earlier in this chapter, postgraduate training in all types of intelligence is being provided for carefully selected officers of the Regular Navy at the U. S. Naval School (Naval Intelligence), which began operations in July 1946 at the Naval Receiving Station, Anacostia, D. C. The course given at this school, which is part of the Postgraduate School, is perhaps the most difficult and intensive ever given by the Navy. It is divided into four phases: classes in intelligence subjects, practical work at sea under simulated battle conditions, thorough mastery of one foreign language, and area study conducted in the language in which the student specializes. Language study requires approximately 14 hours a day from each student, and lasts from a minimum of 3 months for Spanish to 18 months for Chinese. In addition to the Intelligence Division, which is open only to Navy and Marine Corps officers, the school has a Language Division, which is open to qualified personnel from other government departments and agencies.

The majority of naval intelligence billets, afloat and ashore, will eventually be filled by the highly trained and versatile graduates of the U. S. Naval School (Naval Intelligence).

Facilities of the school are utilized to provide a number of intelligence officers of the Naval Reserve with a series of refresher courses in their specialties; thus, experience gained in World War II by these officers is supplemented by instruction on the latest intelligence developments.

Duty in Naval Intelligence was not taken very seriously in the interim between World War I and II. Rapid rotation of Chiefs of Naval Intelligence, and of officers on duty in the Office of Naval Intelligence, destroyed continuity of effort. In establishing the U. S. Naval School (Naval Intelligence), the Secretary of the Navy served notice that the foremost Navy in the world intends to acquire through its long-range, permanent peacetime intelligence training program a thoroughly trained and effective naval intelligence organization.

ORGANIZATION OF NAVAL INTELLIGENCE

Chief of Naval Intelligence

The Chief of Naval Intelligence is charged with administering, operating, and maintaining Naval Intelligence in order to provide intelligence necessary for operations and war plans, and in order to keep responsible naval authorities informed of the war capabilities and intentions of foreign nations and of situations and trends threatening the security of the Naval Establishment. His mission, thus summarized, may be subdivided into a positive intelligence mission and a counter-intelligence mission.

The Deputy Chief of Naval Intelligence performs such duties as may be directed by the Chief of Naval Intelligence and acts for the Chief in his absence. The Office of Naval Intelligence consists of seven branches and a Security Classification Control Board under the Chief and Deputy Chief. These branches are: Administrative Branch, Domestic Branch, Foreign Branch, Protocol and Liaison Branch, Air Branch, Planning Branch, and Operational Intelligence Branch.

The branches contain subordinate sections and subsections which are not listed because the detailed organization of the Office of Naval Intelligence changes from time to time.

We have pointed out that ONI is but one segment of the world-wide organization, Naval Intelligence. However, all naval intelligence officers, wherever located, report to the Chief of Naval Intelligence through the branch heads. Therefore, by describing, rather generally, the activities of the seven branches of ONI, we can present a broad picture of Naval Intelligence as a whole.

Administrative Branch

The Administrative Branch is charged with lightening the administrative burdens of the other branches by providing supplies and services. Among its subordinate sections are those handling mail and dispatches, personnel records, accounts, translating, and reproduction and duplicating work. The *ONI Review* and other special publications are prepared and edited in the Administrative Branch, and Naval Intelligence Training Programs are within its cognizance.

The Administrative Branch has cognizance of administrative matters pertaining to the Reserve Component of Naval Intelligence and is charged with administering that component (Organized and Volunteer) for mobilization purposes. In peacetime, members of the Intelligence Units, Organized Reserve, attend regular weekly drill periods, under training programs conducted in naval districts and river commands by the district intelligence officers, and are required to serve for two weeks each year in an active duty status in a naval intelligence billet.

Domestic Branch

The counter-intelligence aspect of the mission of the Chief of Naval Intelligence is the responsibility of the Domestic Branch, which is charged with supplying such information and intelligence as are needed to protect the Naval Establishment against espionage, counter-espionage, sabotage, and subversion. It is important to note that ONI is not an action agency; after detecting situations or trends threatening the security of the Naval Establishment, it reports the facts to those authorized to take appropriate action. The duties of the Domestic Branch include conducting investigations of naval personnel and of civilians employed by the Navy; protecting the security of classified naval information in war and peace; and, in wartime only, performing various kinds of censorship and commerce and travel control.

In addition to collecting, processing, and disseminating information and intelligence revealing situations or trends threatening the security of the Naval Establishment, it is the responsibility of the Domestic Branch to collect information within the naval districts and river commands on foreign powers. In this connection the branch operates a Contact Register, or card index, of many thousands of sources of positive foreign intelligence in the United States. The collection of information on foreign countries through the district offices is a function of the Domestic Branch.

An important responsibility of the Domestic Branch is the coordination of naval district and river commands intelligence activities, and the support of personnel assigned to them. The district intelligence officer has cognizance of the district intelligence organization, including his own office and the various subordinate branch, zone, and unit offices, which report to him; he in turn reports to the Chief of Naval Intelligence through the head of the Domestic Branch of ONI. Each district intelligence officer has a dual responsibility — to the commandant of the naval district in which he is stationed and to the Chief of Naval Intelligence. He is the intelligence officer on the staff of the district commandant, just as the Chief of Naval Intelligence is the Intelligence Officer on the staff of the Chief of Naval Operations. He is under the military command of the district commandant.

In matters under his jurisdiction, the head of the Domestic Branch maintains working liaison with other divisions and bureaus of the Navy Department and with other government departments and agencies; and district intelligence officers maintain similar liaison in the field.

Foreign Branch

While the counter-intelligence aspect of the mission of the Chief of Naval Intelligence is the responsibility of the Domestic Branch, the positive foreign intelligence aspect of that mission is assigned to the Foreign Branch, which is charged with collecting information on the capabilities and intentions of other nations and with supplying such intelligence on foreign powers and theaters of operation as may be required by the policy, planning, operations, and logistics officers of the Navy.

Much of this information is acquired from our naval attaches and other naval intelligence personnel on duty in foreign posts. Naval attaches are nominated by the Chief of Naval Intelligence, assigned by the Secretary of the Navy, commissioned by the State Department, and ordered to report for duty to chiefs of diplomatic missions. The naval attache owes dual allegiance — to the chief of the diplomatic mission to which he is assigned, and to the Chief of Naval Intelligence.

The responsibility of naval attaches, naval liaison officers, and naval observers alike is to represent the United States in a thorough and creditable manner, and to collect and report information and intelligence of value to the United States, in peace and war, with particular emphasis on matters of naval interest.

The Foreign Branch of ONI supports these naval intelligence officers on foreign duty, coordinates their activities, and maintains a staff of experts competent to process the positive foreign intelligence received from all sources. Certain sections in the Foreign Branch have cognizance over certain foreign areas and technical subjects.

Intelligence handled by this branch is divided into two categories—current intelligence and Monograph intelligence. Current intelligence may be termed "spot news." The Monograph, a comprehensive repository of intelligence about all foreign countries, is kept up to date by current items accruing to it from day to day. A publication entitled *Monograph Index Guides* shows how all conceivable subjects of naval interest are classified.

Protocol and Liaison Branch

Official liaison is maintained by the Protocol and Liaison Branch between the Office of Naval Intelligence and foreign naval and air attaches, certain foreign missions, and distinguished visitors from other countries. This branch is also charged with advising and assisting officers of the United States Navy in matters of protocol, procedure, and courtesy.

The Protocol and Liaison Branch, in maintaining liaison with foreign attaches, provides advice and assistance in such matters as arranging visits to installations of the United States Navy and makes available to them certain nonclassified informational releases on request.

LOOSE TALK MAY ENABLE AN ENEMY TO DO THIS
Counter-intelligence is perpetually on guard to keep our secrets inviolate.

Air Branch

The Air Branch individually and jointly through participation in the Air Intelligence Division (Air Force-Navy) provides information and intelligence on air matters needed by the policy, planning, logistics, and operation officers of the Naval Establishment.

The Air Intelligence Division prepares air estimates on the capabilities of the United States and of foreign powers and combinations of foreign powers to launch air attacks and to defend against them.

Planning Branch

The Planning Branch, like the Administrative Branch and the Protocol and Liaison Branch, does not participate in the intelligence process. It is charged with formulating plans and preparing directives for the efficient functioning of Naval Intelligence, and performs special staff functions for the Chief of Naval Intelligence and his Deputy. In addition to these duties, the Planning Branch has cognizance over organizational problems of Naval Intelligence, and coordinates Naval Intelligence planning within the Navy Department and in relation to the planning of other government departments and agencies.

Operational Intelligence Branch

It is the responsibility of the Operational Intelligence Branch to insure dissemination of all necessary intelligence, including operational intelligence, to the Operations Division of the Office of the Chief of Naval Operations and to commanders of the Operating Force, in order to coordinate intelligence activities of the Operating Forces and to support operational intelligence officers on duty with the Operating Forces.

Security Classification Control Board

In July 1947, a Security Classification Control Board was established under the Chief of Naval Intelligence. The chairman was assigned from the Office of Naval Intelligence, and the other members from specifically designated offices and bureaus. The function of this board is to advise the Chief of Naval Intelligence on matters pertaining to security planning and policy. Its program includes the establishment of classification control officers within certain commands, and the preparation of a manual which will supplement *Navy Regulations* and consolidate various security directives and instructions.

Support Functions Summarized

The seven branches of the Office of Naval Intelligence and the Security Classification Control Board have been briefly described above. No attempt has been made to present a complete picture of their organizations and missions, because these change from time to time, and for reasons of security. The basic organization of ONI, however, has not changed much in recent years and may be expected to remain by and large as at present constituted.

We have seen that in addition to their other duties, certain branches at headquarters are charged with the support of certain categories of naval intelligence officers in the field. These relationships are summarized as follows:

1. The Domestic Branch supports intelligence officers in the naval districts and river commands.
2. The Foreign Branch supports naval attaches, naval liaison officers, and naval observers on duty in foreign countries.
3. The Air Branch supports air intelligence officers on duty with the Operating Forces.
4. The Operational Intelligence Branch supports operational intelligence officers on duty with the Operating Forces.

A large pool of naval intelligence officers with World War II experience exists in the Naval Reserve Intelligence Component (Organized and Volunteer), members of which continue to receive specialized training in peacetime under the supervision of the Administrative Branch. Should a state of emergency be declared, these officers would be called to active duty and would serve in the Office of Naval Intelligence, in the naval districts and river commands, with the Operating Forces, and in foreign countries.

CHAPTER 25

RESEARCH AND ITS EFFECT ON NAVAL WARFARE

INTRODUCTION

General

Secretary of Defense James Forrestal, then Secretary of the Navy, on the occasion of the establishment of the Office of Naval Research in August 1946 made the following statement: "Wars are fought primarily with weapons which are developed before the fighting begins. . . . If a nation is to be scientifically prepared, its preparedness must be worked out in peacetime."

The United States Navy today has among its personnel the world's largest aggregation of technical and research men (at the end of World War II, two out of every three men in the Navy were technicians). Furthermore, it is the largest engineering organization in the world; it is also the largest shipbuilding, repair, and mechanical activity, and the greatest user of power.

Such an organization obviously has had a long and continued interest in scientific research and development. In order to keep its lifelines open, the Navy has constantly kept abreast of progress in practically every field of science; its equipment has consistently been reinforced and otherwise improved, so that the nation's security might be maintained.

Thus the growth of United States naval power has followed closely the progress of science, and new tactics have been made possible by progress in naval technology. At Manila Bay in 1898, for example, Commodore Dewey had to depend on the eyes of his officers for locating the Spanish ships, aiming his guns, and communicating with the other vessels of his squadron. As late as World War I naval commanders had only meager optical equipment for the same work. The tremendous technological advances of World War II, however, have made it possible to find and fire on the enemy even though his ships are far out of sight. Radar, sonar, and other highly complicated devices have changed completely the entire picture of naval warfare.

In this chapter are outlined briefly the stages of naval scientific and technological progress by which the United States Navy from the time of its establishment to the present has been enabled to attain and maintain its position as the leader of the navies of the world.

Historical Background, 1800-1900

The introduction of the steamship in the early decades of the 19th century was closely followed by the conversion of the United States Navy from sail to steam. After 1842 no United States naval vessel was built exclusively for sail. In 1868 the cruiser USS *Wampanoag*, powered by machinery developed by Engineer-in-Chief Benjamin Isherwood, made an average speed of 17 knots in a heavy sea, thus establishing a record that for many years remained unbroken by any vessel, naval or merchant.

During the latter part of the 19th century the submarine was developed as a practical naval weapon, largely on the basis of the experimental work of American inventors. As early as the Civil War the Confederates had sunk a Union ironclad by the use of a submersible spar-torpedo boat, and both sides experimented extensively with this kind of device. After years of development, the first really successful submarine of the United States Navy was commissioned in 1900; the navies of other countries rapidly followed our lead in this new field of underwater operations.

During this same period the Navy also established its first testing laboratories to keep pace with civilian invention and the general progress of technology. These units were among the first well-organized laboratories of the country and reflected accurately the trend away from individual activity toward organized group effort in scientific research. The day of the solitary inventor, working independently in his shop and relying primarily on his own imagination and ingenuity, was rapidly passing. The United States Navy was among the first to realize that scientific and technical problems have many facets, that knowledge from many fields must be pooled, and that the work of many different researchers must be carefully coordinated if the results desired are to be obtained.

RESEARCH IN CHEMISTRY
The Office of Naval Research is conducting far-reaching programs in many fields of basic science.

Thus the Depot of Charts and Instruments, forerunner of both the Naval Observatory and the Hydrographic Office, was established by the Navy in 1830. The first of the Navy's exploring expeditions was sent out in 1838, under Lieutenant Charles Wilkes. In 1849 the Nautical Almanac Office was established; associated with it in its early years were such outstanding men as Lieutenants Charles Davis and Matthew Maury, Superintendent Alexander Bache of the Coast Survey, Dr. Joseph Henry of the Smithsonian Institution, and Professor Benjamin Pierce, leading mathematician of his day. Three of these men—Davis, Bache, and Henry—were the members of the "Permanent Commission" set up by Secretary of the Navy Gideon Welles in 1863 to advise the department on scientific matters. The success of this commission led directly to the chartering by Congress in 1863 of the National Academy of Sciences, to provide such service to all departments of the Government.

Among other early steps taken by the Navy to organize scientific effort was the establishment of research and testing activities in marine engineering and ordnance. In 1866, for example, a device for testing lubricating oils was installed at the New York Navy Yard. Three years later the Naval Torpedo Station was opened at Newport, Rhode Island, to develop and test torpedoes, torpedo equipment, explosives, and electrical devices. The experimental battery and range that had been set up on the eastern branch of the Potomac in 1848 to test naval guns was moved to the Severn River, near Annapolis, in 1872 at which time its facilities were greatly expanded; 20 years later it was again moved, this time to Indian Head, Maryland, to accommodate increasing ranges, and was made into a fully equipped naval proving ground.

Again, in 1896 the Navy Department obtained congressional authorization for an experimental model basin, which was placed in operation at the Washington Navy Yard in 1900. Since moved to Carderock, Maryland, the David Taylor Model Basin has been made into the world's finest research laboratory for the development of optimum hull forms and the gathering of much-needed information about the behavior of ships in water. Today it is in the lead in research on hydrodynamics, ship construction, and ship propulsion, and also carries on significant work in aerodynamics and mechanics.

Shortly after the turn of the century, the Bureau of Steam Engineering (now incorporated in the Bureau of Ships) established the Engineering Experiment Station at Annapolis and the Fuel Oil Burning Laboratory (since 1941 the Naval Boiler and Turbine Laboratory) at the Philadelphia Navy Yard.

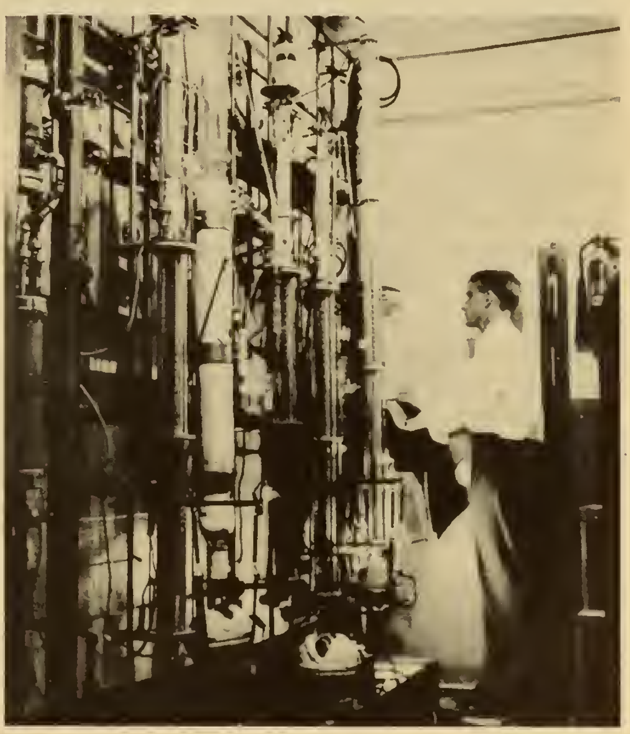
Throughout the period just reviewed, individual naval officers, with or without formal training in science, appreciated the contributions that science might make to naval warfare and applied the scientific method to the solution of their several problems. Lieutenant Maury, as Superintendent of the Depot of Charts and Instruments, stimulated research in astronomy, geology, mineralogy, and oceanography. Rear Admiral John A. Dahlgren, often referred to as the father of modern gunnery, built the Navy's first big guns, advocated the development of effective gun sights, and insisted that naval guns be rifled. In the early 1890's Lieutenant William S. Sims made a thorough investigation of European gunnery practices; subsequently, he was extraordinarily successful in applying the scientific method to the development of gunnery training and fire control. Lieutenant Bradley A. Fiske introduced the range finder, telescopic sights, and director fire into United States Navy practice, and advocated the development of the torpedo plane. As early as 1901, five years before HMS *Dreadnought* was launched, Lieutenant Homer Poundstone designed an all-big-gun battleship. Many other outstanding contributions of these types could be listed.

RESEARCH IN TWO WORLD WARS

World War I

After Europe had gone to war in 1914 but before we had entered the conflict, the Navy Department, keenly aware of the rapid changes being made in naval warfare, took steps to put into effect a more completely organized program of naval research and development. To this end the Naval Consulting Board, popularly known as the Inventions Board, was established in 1915 as a means of mobilizing the nation's technical skills. Under the chairmanship of Thomas A. Edison, it was made up of two leaders from each of eleven outstanding technical groups and scientific societies of the country. In addition to serving the Navy in the capacity for which it had been created, this Board organized the nation's Industrial Preparedness Campaign and recommended that the Navy Department establish a permanent experiment and research laboratory.

In like manner the National Academy of Sciences set up the National Research Council as a working organization by which the resources of different groups of scientists could be brought to bear in the solution of the major scientific and technical problems of the War and Navy Departments. In this way research of the greatest importance was undertaken



NAVAL SCIENTIST AT WORK
Science and national security are closely related.

in such fields as submarine detection, gun ranging, and naval camouflage.

Both the Naval Consulting Board and the National Research Council contributed to the development of antisubmarine warfare devices, the successful development of which had been made imperative by the prowess of Germany's submarine campaign. From the Consulting Board came the design for a nonricocheting shell, from the effects of which a submarine could not escape even by partial submergence. Another device produced by the same organization was the hydrophone, by which the noise of a submarine's engines could be heard at some distance, the sound waves being transmitted by the water; this equipment enabled its user to determine not only the direction but also the distance of the boat spotted. As worked out at New London, Connecticut, the hydrophone played a significant part in winning the first Battle of the Atlantic.

In its race to defeat the Kaiser's submarines, the Navy also developed an improved type of mine, against which a U-boat would have little chance. The mines with which we entered the war, developed for the most part by the British, deteriorated quite rapidly and detonated only when actually struck by a vessel's hull. The new mine, developed by Ralph C. Brown and Admiral Ralph Earle of the Bureau of Ordnance, did not deteriorate so rapidly and, in addition, was provided with long filaments, any one of which would explode the main charge upon touching metal. This was the mine used in the great North Sea mine barrage which did so much to restrict U-boat operations.

The Navy also took steps to protect both merchant ships and its own vessels against submarine attack by the development of "razzle-dazzle" camouflage. Enemy submarine commanders made errors of as much as eight degrees in aiming at ships so painted.

Between World Wars

As has been seen, scientific research had been greatly stimulated during World War I, especially in the field of naval weapons and counterweapons. As a result, immediately after the end of that conflict the United States Navy undertook a rapid expansion of its research facilities. Outstanding in this program was the establishment of the Naval Research Laboratory in 1923 and the conversion of the Mine Laboratory into the Naval Ordnance Laboratory in 1929.

In 1915 Thomas A. Edison, as Chairman of the Naval Consulting Board, had urged the creation of a laboratory to be devoted entirely to naval research. Congress voted funds for this purpose the next year, but it was not until 1923 that work was completed and the Naval Research Laboratory (NRL) was formally opened at Anacostia, D. C. Its operations during the next two decades contributed greatly to preparing the Navy for its effective participation in World War II; in particular, they provided an accumulated body of knowledge on which our scientists and technologists were able to draw for development of radar, the proximity fuze, and the atomic bomb.

Commenting only on the background work leading up to radar, we find that scientists at NRL began experimenting with radio direction-finding equipment almost as soon as their laboratories were opened. As early as 1930 a formal report to the Bureau of Engineering proved so promising that they were directed to "investigate the use of radio to detect the presence of enemy vessels and aircraft." At the request of Rear Admiral Harold G. Bowen in 1935 Congress allocated $100,000 to NRL for carrying on this development, and by April 1937 the Navy had radar working over salt water from the old four-stacker *Leary*. From such sources came this important antiaircraft and antisubmarine weapon, which both the Army and the Navy used so effectively in the struggle against Nazi Germany.

The Naval Ordnance Laboratory (NOL) likewise conducted valuable scientific investigations during the period between the wars. Established by the Bureau of Ordnance as the Mine Laboratory in 1918, its original assignment turned principally on the development of an improved type of mine-firing device. Transferred to White Oak, Maryland, and renamed Naval Ordnance Laboratory, it rapidly got underway an extensive program covering research in and the development of torpedoes, mines, depth charges, mine-launching equipment, fuzes, pyrotechnics, ordnance parachutes, demolitions, guided missiles, plastics, guns, armor, and minesweeping equipment.

Another important establishment provided for during the war but actually doing some of its most important work during the peace which followed, was

MEDICAL RESEARCH CONTINUES IN PEACE
A broad program of medical research is conducted by the Navy. Among the buildings of the National Naval Medical Center in Bethesda, Maryland, is the Medical Research Institute, one of the best-equipped laboratories in the world.

the Naval Aircraft Factory, first set up at the Philadelphia Navy Yard in 1917. With the advent of the airplane, a new field of engineering and technology had to be developed. The David Taylor Model Basin undertook the construction and operation of one of the first wind tunnels in the United States for studying the aerodynamics of flight, but it soon became apparent that additional facilities and arrangements for aeronautical research were badly needed. The Navy fostered the idea of a National Advisory Committee for Aeronautics, and Congress in 1915 established such a committee to "supervise and direct the scientific study of the problems of flight with a view to their practical solution" and to "direct and conduct research and experiments in aeronautics." Two naval officers are members of this Committee, which for many years was housed in the Navy Department. In 1921, the Naval Aircraft Factory began work on experimental aircraft and, in cooperation with the Committee, made significant contributions in the field of aerodynamics. It was a group of enthusiastic naval officers at the Naval Aircraft Factory who advocated the development of guided bombs or planes years before the Germans were to make the first recorded combat use of radio-controlled missiles.

When the long-threatened World War II began in September 1939 with the conquest of Poland, and the United States launched its program of national defense, the Navy had already laid the foundations by scientific research for its growing strength.

World War II

World War II marked the largest mobilization of scientists in the waging of war that the world has known. It was the physicist working quietly in his laboratory who developed the acoustic fundamentals on which were based the antisubmarine devices that helped the United States Navy defeat the U-boat and strangle Japan by power beneath the surface of the sea. The mathematician working on his differential equations and mathematical formulas gave to our Armed Forces the fundamentals of fire control and helped develop the computing devices for the gun directors and airborne torpedo directors that played so important a part in the attainment of final victory.

Realizing that superiority in new weapons would be essential in defeating the enemy and that this superiority depended on scientific knowledge, President Roosevelt in June 1941 established the Office of Scientific Research and Development (OSRD), to coordinate and, where necessary, to supplement scientific research and development work relating to the war. The nation thus set up the machinery to enlist its scientists in the fight against the enemy.

The Navy immediately established an Office of Coordinator of Research and Development which, under Rear Admiral Julius A. Furer, handled the necessary Navy liaison with OSRD. The Navy was ready and eager to work with OSRD and was able to offer to this organization its facilities and experience in research and development programs. The application of the products of science to warfare is a slow process; it takes years for a new weapon to pass through the successive stages from the first idea to research, development, testing, quantity production, and finally to actual use. The groundwork already laid by naval research workers was to save priceless time when time was what we needed most.

Examples of the Navy's preparedness for war through science are given by Dr. James P. Baxter in *Scientists Against Time,* his Pulitzer prize winning account of the OSRD's activities during the war. A few quotations are presented here from Dr. Baxter's discussion of developments in five fields.

Fire Control. The Navy "had gone a long way in developing fire control. . . . Our Navy's systems of fire control were the best in the world."

Proximity Fuze. In discussion of the development of the proximity fuze which ranks "among the most extraordinary scientific achievements of the war," Dr. Baxter states, "When the OSRD was established, the problem of proximity fuzes had already been under consideration for some time in the United States Navy."

Undersea Warfare. "The United States Navy started the war with well-developed echo-ranging gear. . . . Between the two wars the Naval Research Laboratory had made notable contributions to supersonic echo-ranging gear."

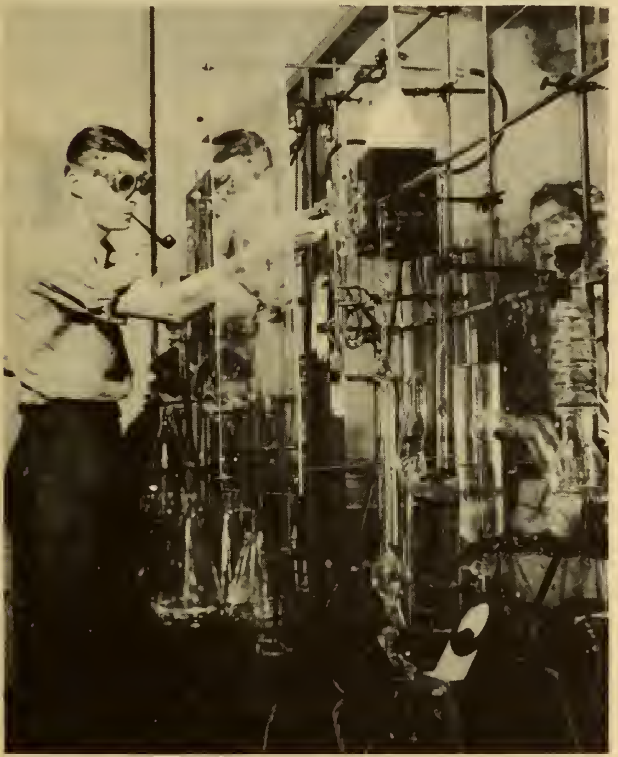
PIONEER IN RADAR

A well-known scientist examines one of the elemental radio tubes in the first radio set at Naval Research Laboratory, Anacostia, D. C.

Radar Countermeasures. "At the Naval Research Laboratory, where radar had been under development for years, the possibilities of countermeasures had also been explored. Prior to our entry into the war NRL had developed a wide-band crystal receiver to pick up enemy transmissions and determine their frequency, and had under development a receiving set to cover the range from 50 to 700 megacycles."

Atomic Bomb. As early as 1939, Rear Admiral Harold G. Bowen, then Chief of the Bureau of Engineering, allotted $1500 to the Naval Research Laboratory for experiments on pilot plants for the concentration of Uranium-235. This was the first government work, and at the time the only government work, on the project which grew into the atomic bomb development. Later, when the Manhattan District coordinated all work on the bomb, a thermal diffusion plant needed for the partial separation of U-235 was built along lines which Baxter reveals "had been worked out by R. Gunn and P. H. Abelson at the Naval Research Laboratory and tested in pilot plants built by the Navy at Anacostia and Philadelphia."

The Navy had indeed been mobilized for 20th-century warfare. Years of systematic research paid dividends when in 1940 Congress voted a 70-percent increase bill that gave America a two-ocean Navy. The bill provided for 32 battleships, 85 cruisers, 19 plane carriers, 358 destroyers, and 185 submarines, to give the United States the greatest armada ever known. But the power of this fleet lay in the new capabilities with which previous research had endowed it. *The new fleet was fast:* In battleship construction alone, by adopting a relatively narrow beam with light armament, it was possible to use powerful engines capable of driving the vessel at a speed estimated in some quarters as 35 knots. *The new fleet was superbly equipped:* It could maintain itself longer at sea and cope with land-based air power and submarines while thousands of miles from home and close to enemy bases. *The new fleet had eyes to see hundreds of miles away:* With radar the fleet could scan the ocean for surfaced submarines and the skies for aircraft for more than 150 miles at all times of day or night regardless of weather. *The new fleet was well protected:* Destroyers and destroyer escorts with their sonar gear and their greatly improved antisubmarine ordnance protected the fleet against enemy submarines from below while planes of the antisubmarine patrol equipped with radar, rockets, and better depth charges gave protection from above.



A COMPLICATED DEVICE TO SOLVE A COMPLICATED PROBLEM
The growth of United States naval power has followed closely the progress of science.

This, then, was the fleet that American scientific genius sent forth to meet the enemy. Our scientists had prepared it with the newest in weapons and devices and they continued their diligent watch during the war. While the fleet was engaging the enemy, the men in the laboratories were perfecting equipment and analyzing attacks, assessing combat results, going along as observers on missions, and returning to the laboratories to work night and day exploring scientific knowledge for new ways of assisting the men behind the guns.

At Quonset Point Naval Air Station during the war, scientists were working furiously on the magnetic airborne detector, an important aid for underwater detection, building hundreds of pre-production types of equipment, installing them in planes and blimps, and making observational flights.

At the Naval Ordnance Test Station, hidden in the wastes of the Mojave Desert in California, the Navy's high-velocity aircraft rockets, "Tiny Tim" and "Holy Moses," were being tested under extremely hazardous conditions and strict security regulations. Armitage Field at this station is a memorial to the services rendered by a Navy flier, Lieutenant Armitage, one of the men who lost their lives trying out new equipment before it was deemed safe for the fleet.

At New London, Connecticut, and San Diego, California, scientists in the Navy's Underwater Sound Laboratories were studying underwater acoustics to develop more effective aircraft, submarine, and surface craft listening equipment and other devices that would help sink more German and Japanese submarines.

At the Naval Air Station, Floyd Bennett Field, New York, flight tests were being conducted with the "Bat," the first completely automatic airborne target-seeking missile to be used in warfare. Conceived by the Navy's Bureau of Ordnance and employing principles developed at the NDRC Radiation Laboratory at Massachusetts Institute of Technology, the Bat is a glider bomb that locates its target by radar and then steers itself toward the chosen target by following the reflected radar beam.

In Washington, D. C., the Navy was conducting operational research to see whether equipment and weapons were filling contemplated needs or whether something better should be developed. Operational research was also the basis for new or improved strategical and tactical doctrine.

At Alamogordo, nuclear physicists were helping Rear Admiral Parsons ready the atomic bomb for its debut, at Hiroshima.

The naval scientists' laboratories were located in many corners of the United States and their products reached points thousands of miles away. Their close watch on the fleet was continued throughout the war.

Even the enemy was forced to pay tribute to the American scientist. On 14 December 1943, Germany's Admiral Doenitz wrote, "For some months past the enemy has rendered the U-boat war ineffective. He has achieved this objective, not through superior tactics or strategy, but through his superiority in the field of science."

This "superiority in the field of science" helped America's greatest armada attain an unmatched peak of effectiveness that brought victory on a two-ocean front.

FIRE LANE
KEEP CLEAR

NAVAL AIR MODIFICATIONS UNIT, JOHNSVILLE, PENNA.
This is a scene in the manufacturing section of the Naval Air Modifications Unit. Behind the products is a broad program of experiments, especially in pilotless aircraft and guided missiles.

POST-WAR RESEARCH

Scope of ONR Activity

The smoke had hardly cleared over devastated Hiroshima when the United States Navy started to put into effect the most extensive peacetime scientific research program ever undertaken. Almost three months before the atom bomb fell on Hiroshima, Secretary Forrestal had established the Office of Research and Inventions to assure the Navy a well-coordinated research effort in every field of basic science.

Renamed and given statutory permanence by Congress in August 1946, the Office of Naval Research now has underway far-reaching programs in the following fields of basic science: nuclear physics, physics, chemistry, electronics, mechanics and materials, geophysics, fluid mechanics, and mathematics. In the naval sciences, research is progressing in undersea warfare, amphibious warfare, power, armament, and air warfare. In medical science as well, ONR is sponsoring research which is coordinated with the work of the Bureau of Medicine and Surgery described below.

Virtually every outstanding scientific laboratory in the country, whether it be part of a big industrial plant or part of a university's science department, is working on some phase of the research program of the Office of Naval Research. Leading scientists of the country are guiding this tremendous scientific effort for the benefit of the Navy and our national security.

At Navy headquarters in Washington, in branch offices in key cities throughout the country, and in England, the Office of Naval Research maintains a reserve group consisting of engineers, physicists, chemists, and mathematicians working in close cooperation to insure an adequate program of fundamental research in the natural and applied sciences for the Navy. These scientists constantly review and appraise contracts for basic research with industrial laboratories, private research institutions, and universities.

To coordinate further the research activities of the Navy, the Naval Research Laboratory has been made a part of the Office of Naval Research. NRL is currently undertaking research and development projects of great complexity and in addition is carrying on operational and technical evaluation of major equipment, units, and systems. Some of the fields being investigated are chemistry, electronics, metallurgy, optics, physics, radio, and sound.

Specific Studies

The Special Devices Center, located at Sands Point, Long Island, New York, is also a part of the Office of Naval Research. It is responsible for the conduct of research and development in the fields of synthetic training and human engineering.

LABORATORIES OF THE OFFICE OF NAVAL RESEARCH
The Office of Naval Research is the coordinating agency for the Navy's research projects.

The term *synthetic training* characterizes methods and equipment devised for the instruction of students under simulated operational conditions. Synthetic training methods and devices developed by the Special Devices Center have proved an effective answer to the problems of training, not only in the saving of time, but in giving a better concept of the operation and handling of combat equipment. The magnitude of the effort directed toward the development of new, complex weapons and equipment in all branches of the Service has made it necessary to find new and more effective ways of teaching their use to young and previously unskilled personnel. Consequently, the Special Devices Center aims to develop new training equipment for all naval activities, producing, installing, and servicing equipment requested by cognizant bureaus. Further synthetic training equipment is developed concurrently with development of operational and combat gear. Particular emphasis is placed on human factors and their effect on functional equipment design for maximum utilization. As a result, the work of the Special Devices Center influences not only training methods but also the basic design of new combat equipment.

There are within the Naval Establishment a number of other activities under the direction of the material bureaus where research, development, engineering design, acceptance testing, and trouble shooting of naval equipment are conducted, but they are not exclusively research laboratories. The most important of those that have contributed to research, in addition to those mentioned earlier in this chapter, are the Naval Air Experimental Station at Philadelphia, the Navy Electronics Laboratory at San Diego, the Underwater Sound Laboratory at New London, and certain of the testing laboratories in naval shipyards and operating bases.

The man who is to operate the Navy's weapons of the future is also the subject of extensive research. Until very recently machines and equipment have been designed and built on the basis that man could adapt himself to them. With the growing complexity of communications equipment, aircraft instrument panels, fire-control apparatus, and navigational in-

TEMPERATURE CHAMBER
Scientists prepare for an experiment in cold-weather clothing at the Naval Research Laboratory.

struments, it is realized that these cannot be operated and maintained unless fitted to the man. As we approach supersonic speeds in the air, new problems in human adaptability and protection arise. The human factors that must be considered in engineering design are constantly under study and as time goes on more and more new designs are developed and the old ones simplified.

The health needs of men working and living in varied climates and under varying conditions are being explored by scientists. Not only are the best kinds of clothing, food, and shelter sought, but also the mental health of the individual under conditions of stress is a matter for research investigation. Diseases indigenous to the many areas—tropical, subtropical, temperate, and polar—are also being studied for the development of preventive and curative measures. The primary center of all naval medical research is the Naval Medical Research Institute, Bethesda, Maryland, which contains one of the finest equipped laboratories in the world. Medical research is also being conducted at other centers such as the Naval School of Aviation Medicine and Research at Pensacola, Florida, where various aspects of the aviator's health are being studied; the Medical Department of the Naval Air Material Center, Philadelphia, which is concerned with incorporating physiological principles into aircraft equipment; the Naval Medical Research Laboratory at the Submarine Base, New London, engaged in research in submarine medicine; and the Medical Field Research Laboratory at Camp Lejeune, North Carolina. There are also naval medical research units at Cairo, Egypt; in Dublin, Georgia; and Berkeley, California, where agents of disease in those environments are studied. The Navy laboratory literally embraces the world; the Navy test tube is continually seeking new answers.

Already the shape of things to come is apparent.

Atomic-powered warships are within the realm of possibility. Atomic missiles may arm the ships of the future. Guided missiles may be launched from the decks of ships to defend vital outposts. Submarines may be able to travel so fast and so deep and submerge for such long periods that undersea warfare will be revolutionized. High-speed flight has burst through the transsonic barrier into a realm of supersonic speeds where a whole new science of aerodynamics must be learned. Meteorologists may soon be able to control certain aspects of the weather.

Scientific Preparedness

Many of the weapons of World War II are already obsolete. No one can predict exactly what the next decade will bring, but anyone can predict that no nation can survive without the closest tie-in with science to supply the knowledge that will more sharply define the weapons of the future. It has been definitely proved in past wars that the nation's research and development for military purposes are based fundamentally upon the extent of scientific knowledge accumulated during times of peace, its industrial capacity for carrying these developments to fruition, and its scientific manpower. The atomic bomb is perhaps the outstanding example of a weapon engineered during wartime from basic scientific knowledge acquired years before the fighting began. Technical manpower is as important to the security of a nation as a trained army. A nation is no stronger than the strength of the scientific core from which it can draw in times of emergency.

The Navy's long-continued interest in science and its years of systematic research are proof that it has long believed in being scientifically prepared. Its responsibility for the nation's security requires that it constantly explore all fields of science for the new power that such research may bring; basic research—an imaginative and speculative reaching into the unknown—often leads to unsuspected progress that would not have been made if the improvement of specific weapons, ships, and planes were the only aim of the Navy's research and development groups. Thus, young scientists are being trained by working on Navy-sponsored research projects; expensive research facilities, equipment, and instruments, such as cyclotrons and wind tunnels, are being added to the country's scientific resources; and last but not least, new knowledge is being acquired to strengthen the Navy of the future, whatever its character may be. Changing concepts of naval warfare may demand new and different weapons, ships, and planes for subsurface, surface, and air warfare, but science will aid the Navy in meeting all such requirements, however novel they may be.

CHAPTER 26

ESSENTIAL COMPONENTS

THE CIVIL ENGINEER CORPS

Background

The need for civil engineering in the Navy arose in 1794 when Congress authorized construction of six frigates, the first units of the permanent Navy. With the completion of these ships, provision had to be made for the essential job of serving them. For many years this work was done by civilians, and even after the establishment in 1842 of what is now the Bureau of Yards and Docks, civil engineers were employed in a civilian status. But during the Civil War, it became increasingly apparent that engineers in a civilian capacity could not function with maximum efficiency in a military organization. Consequently, in 1867, civil engineers were commissioned as staff officers in the Regular Navy, and four years later they were granted relative rank with officers of the line. The Civil Engineer Corps was then a very small organization consisting in 1881 of one captain, two commanders, and seven other officers.

In 1898, Rear Admiral Mordecai T. Endicott, a graduate of Rensselaer Polytechnic Institute and one of the first civil engineers commissioned in the Navy, was appointed Chief of the Bureau of Yards and Docks; and in 1906, a law was passed providing that thereafter the chief of this bureau should be selected from officers of the CEC. Prior to 1906, all appointments to the Corps had been made from civil life. In that year, two line officers, graduates of the Naval Academy, were selected for post-graduate training at Rensselaer and for transfer to the Corps. Since then the Corps has been recruited from both sources.

Purpose

The functions of the Civil Engineer Corps are the same now as when the Corps was formed: To supervise the design, construction, and maintenance of the shore establishments, including now more than 100 types of major facilities. The scope of activity can best be comprehended if it is remembered that any structure, whether house, hangar, warehouse, waterwork, sewer, storage tank, harbor work, or hospital, that is used by the Navy was designed and constructed by the Bureau of Yards and Docks through its CEC officers.

Wartime Organization

Previous to World War II, the work of the CEC officer had been that of engineer and construction boss exclusively. Since there were no enlisted men under the cognizance of the Bureau of Yards and Docks, the supervisory function of the CEC extended only to civilian employees. After Pearl Harbor, when the need had arisen for forming the construction battalions, supervision of these enlisted forces was added to their duties.

Like all other branches of the Armed Services, the CEC mushroomed to unprecedented size during World War II. The fact that about 98 percent of all its officers were Reserves presented a sizable training problem. In the early part of the war, the need for Seabee units overseas was so great that officers received correspondence course instruction in naval regulations and command functions while at work at advanced bases. Officers who were commissioned later were given indoctrination before being assigned to their units, and by 1944 a midshipman school was operating at Camp Perry, near Williamsburg, Virginia, and gave officers obtained by direct commissioning a two-month course. These men, engineers from V-12 and NROTC units, were enrolled during the first months as apprentice seamen; during the second month they were midshipmen; and at the end of the course they were commissioned ensigns in the Corps Reserve.

Activities in World War II

Of the three primary elements of warfare—strategy, tactics, and logistics—the last has undergone the greatest changes in modern times. The increasing complexity of warfare has made the supply problem an enormous one, both because of the enlarged scale and scope of war and because of its accelerated pace. For this reason, the wartime job of the Bureau of Yards and Docks as administrative component and of the CEC as operational force was unprecedented, since that job was mainly one of logistics. Fueling and docking facilities had to be established; food and equipment depots were needed to handle supplies for the combat areas; hospitals were necessary to receive the wounded and sick; and repair facilities for ships had to be equipped and ready for instant action. Most pressing of all was the need for airstrips.

CIVIL ENGINEER CORPS DESIGNS BUILDINGS
The 16-story warehouse at New York Naval Shipyard is a spectacular achievement of the CEC.

Many CEC officers were engaged in supervising the work of Naval Construction Battalions, Special, which performed stevedoring; still others supervised the specialized work of Seabee maintenance units which took over the maintenance of advanced bases, thereby releasing construction battalions for participation in new landings; or they were in charge of pontoon detachments, smoke generation units, malaria control units, and underwater demolition teams.

The largest single program was for aeronautical facilities. The CEC designed and supervised construction of 84 air stations, many of which cost over $10,000,000; as examples, the work done at Alameda, California, cost approximately $90,000,000 and that at Corpus Christi, nearly $84,000,000.

New Developments

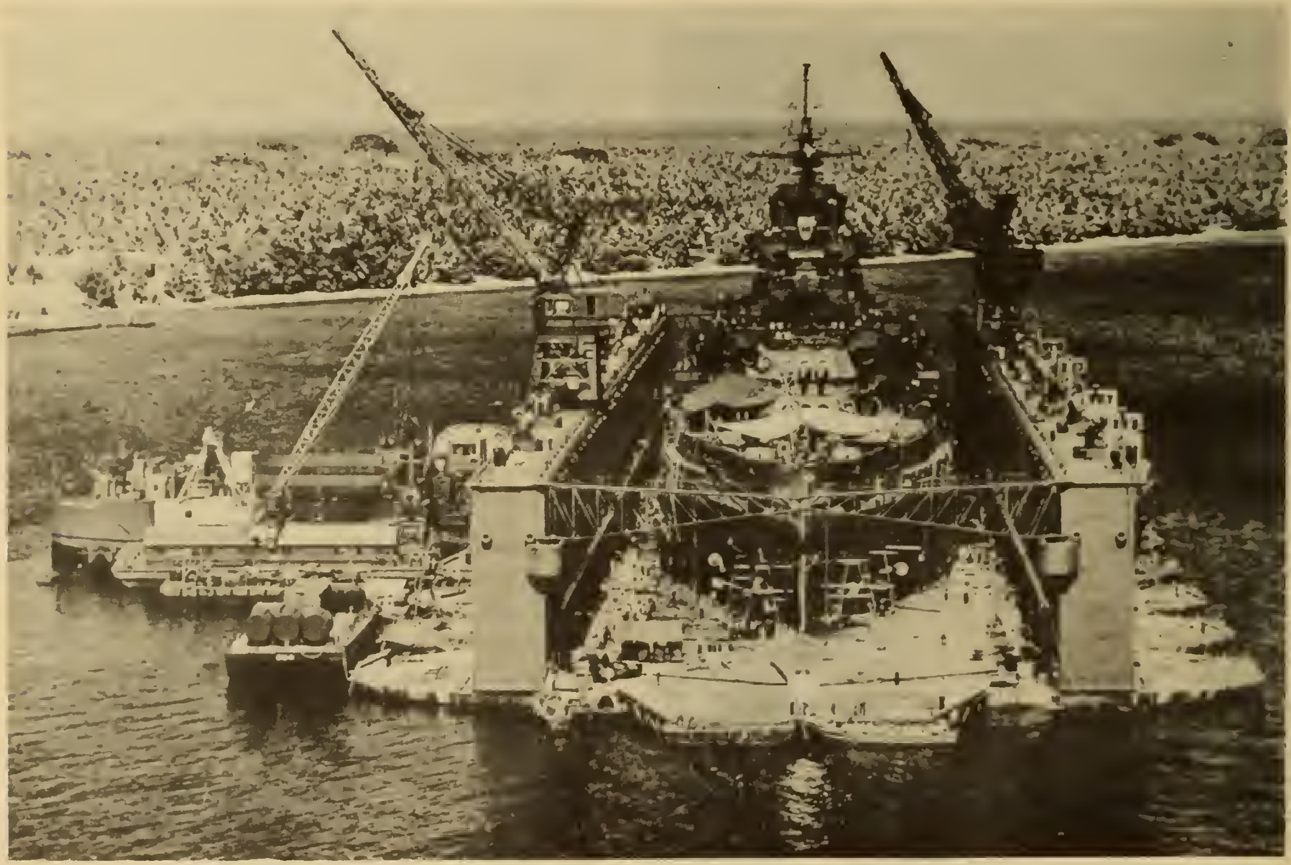
It is generally believed that the outbreak of war brings a rush of new inventions and improvements conceived in the heat of conflict and on the spur of the moment. What is frequently overlooked is the fact that much of this work actually is done during peacetime. The duty of the military man is to plan in peacetime for the exigencies of war and to be ready for the sort of war that contemporary science has developed. Usually his plans are not made known until wartime, however, because of military security requirements and because it is only in wartime that appropriations are forthcoming to permit concrete realization of those plans.

An outstanding example of CEC pre-war planning is the floating drydock. As late as July 1940, the Navy had only three such structures, and these had been designed for use in quiet harbors where outside facilities existed for power and for crew accommodations. It was apparent to the Civil Engineers that if war came there would be sea fighting on a scale previously unknown, and that ships would need repairs thou-

CEC ACHIEVEMENT IN HANGAR CONSTRUCTION
CEC-designed hangars at Patuxent River, Maryland, have concrete arch-ribbed roofs.

sands of miles from home ports. To this end, they prepared radically new designs for a fleet of floating drydocks that could repair ships close to the scene of battle, making it possible for the damaged ships to return quickly to the fight and, in some cases, repairing ships that otherwise would not have been able to make the long voyage home for shore repairs.

The designs included docks that carried their own power machinery and crew quarters, docks with ship-like hulls for fast towing, and, most important, docks of a size that could handle the largest ships afloat. This last type represented a bold gesture on the part of the Civil Engineer Corps. Originally, it was planned to build a single-unit dock capable of cradling a battleship. But because such a structure could have been sunk by a single torpedo, the Corps abandoned the plan in favor of a dock built in sections. The sections could be towed to an advanced base and there



FLOATING DRYDOCK
Sectional drydocks were another accomplishment of the Navy engineers.

welded together into a single dock. The risk, however, lay in the fact that such a dock had never been built, and if it were to prove unsuccessful, our heavy ships would be without any mobile docking facilities.

The floating drydock, as is now well known, was a complete success. Called the advanced base sectional dock (ABSD), it consisted of ten sections that were interchangeable, so that when hit, the damaged section could be cradled in the other sections and repaired. These docks are capable of lifting 100,000 tons and, with the smaller ones, played so important a part that during the last year of the war, the 150 war-built floating drydocks, serviced 7,000 ships in combat areas.

Hardly less spectacular was the development of the pontoon in its myriad applications. Some time before the war, the pontoon had been considered for sectional structures, but the problem of connecting pontoons and retaining rigidity was solved only after much experimentation by the CEC officers who worked out a proper-size pontoon and an ingenious system of wedges and bolts for connecting them. The pontoon was put to many uses. Various assemblies were made, including net tenders, warping tugs, causeways, floating cranes, drydocks, finger piers, seaplane service piers and ramps, and even an experimental aircraft landing field.

CEC DESIGNS HEAVY MACHINERY FOR SHIPYARDS
Responsibility for maintenance and repair of heavy lifting machinery is also delegated to the Civil Engineer Corps.

CONSTRUCTION OVERSEAS
The Civil Engineer Corps built these fuel piers at the Londonderry Base in northern Ireland.

After performance tests at Quonset Point, Rhode Island, an outboard-type motor was selected as the pontoon propulsion unit. Using the pontoons with this unit, the Corps developed the rhino ferries that proved so successful in the Normandy invasion.

Previously the CEC brought forth the pontoon causeways which, launched from ship-side at full speed ahead, enabled our forces to bridge the shallow waters along the southern coast of Sicily, to the surprise of the Germans who had considered those waters a natural barrier. Some 10,000 Army vehicles rolled from ship to shore over the steel pontoon bridges, and set the pattern for every ensuing invasion in the war.

THE SEABEES

Establishment of the Seabees

Naval construction battalions, popularly known as the Seabees (from the initial letters of the words *construction battalion*), were established under the cognizance of the Bureau of Yards and Docks to meet the wartime need for uniformed men to perform construction work in combat areas. They served as an adjunct of the Navy, under officers of the Civil Engineer Corps. The idea of militarizing the Navy's construction workers was developed in World War I when a small force was organized at Great Lakes Naval Training Station. During the intervening years, an elaboration of the original concept was developed; however, the Seabees as they emerged in World War II reckon their "birthday" as 28 December 1941, the day authorization was received for the formation of the first naval construction regiment, consisting of three battalions.

With the advent of World War II, it became apparent that the services of contractors and their civilian employees engaged in building naval projects at numerous overseas points could not be utilized adequately for construction work in combat zones. In the first place, under military law their status as civilians prevented them from offering resistance to an enemy without becoming liable to summary execution as guerrillas in the event of capture. Further, civilian workers lacked training necessary to defend themselves. This was grimly demonstrated at Wake, Cavite, and Guam, where many civilian construction workers were killed and many more captured.

Battalion Organization

A construction battalion is composed of four companies which include the necessary construction skills for any job, plus a headquarters company consisting of yeomen, storekeepers, cooks, and so on. A battalion is a complete operating unit when sent into the field on its own, although its training, assignment, and work are the responsibility of the Bureau of Yards and Docks.

The complement of a battalion is set at 34 officers and 1083 men. Because it is a construction battalion, the bulk of the officers are assigned from the Navy's Civil Engineer Corps.

The wartime Seabees were typical American workers: the plumber who had fixed the leaky faucet, the carpenter who had built the bungalow, the steam-shovel operator working on the foundation of the new office building downtown, the truck driver, the wharf builder, the engineers, surveyors, draftsmen, clerks; altogether some 60 trades and professions were represented in the ranks of the Seabees.

It was necessary to train these Americans in the military adaptation of civilian construction methods and to teach them military discipline and the use of arms with which to defend themselves. The problem of discipline was important. Navy contractors would have had a problem in keeping civilians on such a job as that at Guadalcanal. Nothing less than military discipline would have seen the job completed in the face of long hours, unnatural conditions brought about by climate, and enemy bombing and shelling. Wages cannot be raised high enough to pay for that

So when we reach the
"Isle of Japan"
With our caps at a
Jaunty tilt
We'll enter the city of Tokyo
On the roads the SEABEES
Built.
Third Marine Div.
2nd Raider Reg.

TRIBUTE FROM THE MARINES
This testament of the Marine Corps' admiration for the Seabees is eloquent tribute to their effectiveness.

kind of work and patriotism is likely to wear thin under such circumstances unless reinforced by military organization.

Regular Navy ratings were given to the Seabees on the basis of the kind and amount of their civilian experience. For example, a steelworker or a pipefitter of long experience who had risen to a position of responsibility—perhaps a foreman or owner of a small business—was rated a chief shipfitter or shipfitter, first class; a master carpenter might be given a petty officer rating as machinist's mate.

The battalion was the fundamental unit of the Seabee organization. Seabee recruits were trained in battalion strength and ordinarily were sent overseas in battalions. In the beginning, the battalion operated overseas as an independent unit, with the officer in charge solely responsible for making all decisions of an engineering and military character. However, as the number of battalions in a given area increased, and as large construction projects were undertaken, a higher command echelon became necessary to coordinate the work. Consequently, naval construction regiments were established to satisfy these requirements. In large areas, where many battalions operated, brigades were formed, and finally, at Okinawa, a task force unit was created, embracing over 100,000 Seabees and United States Army and British engineers. Altogether, 54 regiments and twelve brigades were formed.

SEABEE BRIDGE ON GUADALCANAL
A construction battalion erected this bridge in a day and a half.

Primary Function

Seabees participated in every major amphibious operation conducted by American fighting forces, either Army or Navy, including the crossing of the Rhine. Not infrequently, they came ashore immediately after the assault waves. Their obligation was to assist in the unloading and rehabilitation of combat equipment and supplies. Later they undertook the rehabilitation of existing airfields and the construction of new fields.

Construction of an advanced base—the Seabees' primary function—involved more than may be realized. A typical project was the construction of an air base. The first job here was to get equipment ashore despite enemy opposition. Obstacles, man-made and natural, barred easy access to the beach. After the beachhead was made, roads had to be cut inland to the site of the camp and airstrip. Supplies and equipment had to be moved off the exposed beach. Following this, many activities got underway simultaneously: A campsite had to be cleared and a source of water found and developed; hospital and messing facilities had to be set up; gun emplacements had to be built and radio protection installed; access roads had to be pushed through (at Vella Lavella, Seabees roughed out nine miles of road the first day), and construction of the airstrip started. If the base was cut out of virgin jungle, clearing the area in preparation for the strip was arduous enough, but generally it was complicated by difficult drainage and grading problems.

Usually, maximum speed was required during this early period, because the field was necessary for protection of the base. Construction went on from daylight to dark and sometimes throughout the night. The menace of enemy aircraft was always present, with snipers sometimes operating from the jungle's edge.

Where coral was available, it was dug from the earth or blasted and dredged from the sea to provide topping for the airstrip. In many instances, pierced steel planking also was laid. Customarily, it took about two weeks to develop a fighter strip to the point where planes could land and take off. Frequently, strategy dictated that a fighter strip was to be enlarged to accommodate bombers. This meant lengthening runways, building hard-stands, and constructing revetments.

Meanwhile construction of other facilities proceeded apace. A pier and dock would have been built, and fuel tanks for aviation gas erected and camouflaged; by now power plants, warehouses, and shops had been put up and permanent structures for personnel replaced makeshift quarters; an administration building, dispensary, post office, and utility structures were readied for use.

Such a base was built by a single battalion of Seabees, serving as an integral part of an all-service air base unit. For more extensive bases, such as an all-purpose base to fuel and repair ships, supply the fleet, and serve the fleet's air arm, three or more battalions were required.

Scope of Operations

The Seabees built projects costing a few hundred dollars—and projects costing millions. One of the latter was an underground bombproof diesel and fuel

SEABEES BUILT THIS ROAD ON GUAM
Roadways, a vital part of the communications system, were the Seabees' responsibility.

oil storage plant located in the interior of a mountain. They have been assigned the construction of shipbuilding and ship repair plants; port and harbor works; aviation training and operating stations; ammunition depots and ordnance production facilities; supply depots, hospitals, fleet operating bases, fuel depots; housing for officers, enlisted men, and civilians; and floating and graving docks of all sizes and characters.

They constructed bases in the United Kingdom, in Iceland, Newfoundland, Bermuda, in the Caribbean area, in Panama, South America, Africa, Alaska, the Hawaiian group, Midway, Wake, Guam, the Philippines and Samoa, and wherever the fighting forces went in the Pacific. The Seabees constructed over 300 advanced bases of various sizes, kinds, and characteristics in the first two years of the war—some accommodating 50,000 men and containing industrial, hospital, storage, and other facilities of cities several times that population.

Construction Short Cuts

While many of the construction short cuts achieved by the Seabees came from the drawing boards of design engineers, many more could be classified as the "spit and string" type. They were the improvisations worked out during actual field construction. No better examples can be offered than some of the tricks which were put into effect in the quick construction and repair of airstrips in the Pacific. Bulldozers that knocked down palm trees to clear a strip were not unusual, but one battalion found an even faster way. A cable was strung between two bulldozers that ran on either side of a row of palms, sweeping all the trees between them.

In the repair of airstrips after bombing, quick methods were of utmost necessity for it might well be that planes were aloft, circling until the craters were filled.

Another demonstration of Seabee ingenuity was in the uses they made of discarded materials. They cut out the ends of empty oil drums and welded them into drainage pipes by the mile; they used them for culverts, sewers, chimney pipe, shower baths, furniture, stoves, bath-tubs, and rolled them out flat for walls and roofs and dock shoring. They cut them up for trusses, filled them with sand or coral for buttresses, welded them around broken mains, and in one instance at least, used them for the hull of a canoe and equipped it with outriggers from a Japanese seaplane.

SEABEES CONSTRUCT LANDING STRIP FOR AIR ARMS
In the blazing sun of the Pacific jungles the Seabees work to break their own record for speed in constructing an air strip.

In the Marshall Islands, an unpacked shipment of structural steel was found, and Seabees, unable to read the Japanese assembly directions, assumed it was for a warehouse. Only after a thoroughly adequate warehouse had been built out of it did they learn from a Japanese interpreter that it should have been a hangar.

Seabees in Combat

Seabees proved to be excellent defensive troops under fire. General MacArthur awarded the Distinguished Unit Badge to the 40th Seabees for action against the enemy on Los Negros Island in March 1944. Landing at a time when the Army's dismounted cavalry units were struggling to hold their grip on a 200-foot strip between Momote airstrip and Hyane

ROAD TO NORMANDY
Wherever a road was needed the Seabees could build one. This is a pontoon causeway laid down during the Normandy invasion.

harbor against overwhelming opposition, the Seabees drove bulldozers into the jungle to clear fire-lines for Army guns, and during the night, harassed by infiltrating enemy troops, they adopted infantry tactics in self-defense, scouting pockets of resistance and spotting pillboxes. Then, while the enemy was being pushed back, they began repairing the airstrip and building companion facilities.

One intrepid Seabee, a machinist's mate, first class, charged an enemy pillbox with his bulldozer, using the blade as a shield. On reaching the pillbox he dropped the blade, scooped up a sizable amount of earth, and buried the twelve occupants under it.

A group of Seabees, finding themselves the target of a Japanese airborne landing at midnight on Okinawa, threw down their tools and grabbed their carbines. By dawn they had killed or captured every one of the enemy and had saved the parked planes the Japs had come to destroy. The Seabees had already performed a record-making feat on that island by building its first airfield in the short period of four days.

Interrupted by a group of Japanese paratroopers descending on their camp in the Philippines, the Seabees sprayed them with machine-gun fire as they floated down; then drew up a defense line and held them off until reinforcements were sent in by the Army.

Additional Accomplishments

The advanced bases which served as stepping stones to the final defeat of Japan were built by the regular construction battalions just discussed. But as the war progressed, new needs developed and specialized types of battalions and detachments became necessary. The new specialized units ultimately grew into a sizable force, the largest of which was called Naval Construction Battalions, Special; this group functioned as stevedores. They were recruited from the country's leading steamship and stevedoring companies and were taught Navy methods on a mock Liberty ship built on land.

These special detachments were created in the winter of 1942 when the unloading of ships transporting vast quantities of food, ammunition, and other supplies thousands of miles to battlefronts on distant shores became a major problem. At most destinations there were not enough trained men—Service or native—to handle the work.

Other Seabee groups included waterfront battalions that specialized in harbor installations; automotive repair detachments whose specialty was the maintenance and repair of automotive equipment; advanced base depot detachments which were trained to speed the flow of spare parts and replacement equipment; pontoon battalions which specialized in the assembly of pontoon causeways and pioneered their first use at Sicily and Salerno, and manned the sunken causeways at Normandy; and the construction maintenance units (CBMU's) which maintained existing bases so as to free full battalions for building new bases.

Composed largely of Seabees and CEC officers were the underwater demolition teams (UDT's) which swam up to enemy shores preceding an amphibious assault and cleared approach lanes through underwater obstacles.

Seabee Training

At the outset, it was apparent that the formation of experienced construction workers, averaging more than thirty years of age, into efficient military construction units presented training problems both difficult and unique. Since recruiting served the purpose of producing a body of skilled tradesmen, there was need only for military training. This training emphasized judo, close-order drill and the manual of arms, and the use of various weapons. As battalions completed their training, they were sent to one of the advanced base depots where training facilities were provided to enable them to carry on tactical training while awaiting shipment overseas. In addition to military training, small groups of specialists in each battalion received extra training in the operation and maintenance of such specialized advanced base equipment as NL pontoon gear, stills and purifiers, and mobile generators.

Direct voluntary enlistment in the Seabees came to an end in December 1942 to conform to a Presidential order that the Services procure their military personnel through Selective Service. Technical training received by Seabees as training programs swung into action included at times as many as 27 courses, in which skills were taught that ranged from diving to bulldozer operation.

The spring of 1945 proved to be a turning point in the basic concept of Seabee training. At that time, the training of organized construction battalion units ceased, and emphasis was placed on the training of individuals as replacements for the older, battle-tried veterans due for discharge or return to the States. So urgent was the need for replacement that time did not permit extensive trade-school training. However, because of the large number of experienced personnel in the field, it was possible to give effective in-service training to the young, unskilled Selective Service inductees. Consequently, many of the specialist technical training courses were discontinued and in their place elementary military training of approximately four weeks was given.

SEABEES ON "OPERATION HIGH JUMP"
Work party assembles a quonset hut at Little America.

Post-war Organization

Demobilization of the Seabees followed the same rapid course as that of other naval personnel. From a strength of 8,000 officers and 238,000 men on VJ-day, organized into 9 brigades, 31 regiments, and 338 battalions and smaller units, the number has decreased to a peacetime level of one battalion each, to train with the Marine Corps amphibious forces at Little Creek, Virginia, and Coronado, California, plus a few maintenance units and other groups available for specialized operations.

Under the present recruitment plan, men under thirty-one years of age reenlisting in the Navy may, if they qualify, transfer from the line to the Seabees. The enlistment period is four or six years. At reception centers, men with a combined score of 100 on the General Classification and Mechanical Aptitude Tests are placed in the Seabees if they have a desire for such duty, are physically qualified for the work, and have previous experience at mechanical, electrical, or building trades work.

THE NAVY MEDICAL DEPARTMENT

Medical Officers in Early Navy

Members of the medical profession have always played an important role in the Navy. As early as 1775, before the Federal Government was organized, they were an integral part of the crews of the 13 original ships comprising the Navy authorized by the Continental Congress. They have served with gallantry and distinction on every type of fighting ship from the *Alfred,* the sloop-of-war on which John Paul Jones hoisted the first American flag in 1775, to the mighty battleship *Missouri.*

In the early days of the Navy, however, medical officers were not formally organized and had little, if any, relationship to one another. They served as part of the organization of a ship, which for the most part, acted independently as an armed force of and by itself. Appointments were often made by the captain of the ship without reference to any other authority. Some outstanding men doubtless entered the Navy because of the opportunity to travel and to gain wide surgical experience.

Medical officers were assisted by "loblolly boys," the forerunners of present hospital corpsmen, who derived their name from a porridge served sick seamen. In addition to nursing duties, one of their main tasks was to fill a washtub with sand to catch the blood during surgical operations, so that the deck would not be stained.

While *Navy Regulations,* as early as 1798, called for "a convenient place to be set apart for sick and hurt men" aboard naval vessels, the ill-ventilated, poorly lit, and inadequately equipped spaces reserved for the care of the sick on early ships was a far cry from the completely appointed sick-bays of today.

At the approach of a strange sail, the surgeon, surgeon's mate, and loblolly boy took up their stations in the cockpit of the ship, the small space below the waterline, out of range of enemy fire, and usually reserved for the wounded. There, amid the confusion of battle, the medical officer and his assistants had to perform their tasks with the limited resources at hand.

The lifesaving drugs and effective techniques of modern medicine were unknown. Surgeons lacked adequate anaesthetics and antiseptics. Great faith was placed in vinegar as a germ-killer; rum and laudanum were the most frequently used agents for deadening pain. During an operation patients were often strapped to the table, like an animal in a laboratory. On small vessels without the minimum accommodations of the cockpit, surgeons were advised to manage as well as circumstances would permit.

First Naval Hospital

In 1811 funds were first made available for naval hospital construction. Congress in that year directed that the funds derived from a 20-cent-a-month deduction from the pay of naval personnel for the care of the sick, which had accumulated in the Navy Hospital Fund since its establishment in 1799, be used to procure hospital sites and to erect appropriate buildings.

Despite the availability of funds and the fervent pleas of medical officers, the political atmosphere of the "Era of Good Feeling" was unfavorable to such a project, and it was not until 1821 that the first hospital site, in Washington, D. C., was procured. This was followed by the purchase of sites in Boston, Brooklyn, Philadelphia, and Norfolk (Portsmouth). Finally, in 1830, some 30 patients and a 5-man medical staff moved into the first naval hospital at Norfolk. Following the opening of that institution, naval hospitals were erected at irregular intervals on the other sites.

Organization of the Medical Department

The present organization of the Medical Department is the outgrowth of a long-felt need for better coordination and direction of medical activities within the Navy Department. Congress, in two separate moves, tried to meet this need. In 1799, it approved the appointment of a physician general to supervise medical activities of the Army and Navy.

The first real effort to provide a distinct medical organization within the Navy Department was not made until 31 August 1842 when Congress established the Bureau of Medicine and Surgery. Surgeon Barton, who 27 years before had published a *Scheme for Systematizing the Medical Department of the Navy*, was chosen as the first surgeon general from a list of 60 surgeons then serving in the Navy.

Between 1842 and 1860 little progress in the organization of the Medical Department was made. In the 1850's the annual appropriation for that department was only $50,000. There were in service, at that time, 69 surgeons and 80 passed assistant and assistant surgeons.

In the 1860's, the Medical Department expanded with the growth of the Navy. During this decade the hospital at Washington was built; the *Annual Reports of the Surgeon General*, later to be of much value to public health authorities and other officials, were first published; and the Navy's first regular hospital ship, the *Red Rover*, was commissioned. This ship, a sidewheeler captured from the Confederates, was converted into a hospital ship, at St. Louis. Virtually a "floating palace" for its time, it had elevators between decks, fully equipped wards, screened windows, well-appointed operating rooms, and "nine water closets."

U.S.N.
HOSPITAL

FIRST HOSPITAL SHIP
The USS *Red Rover*, the Navy's first regular hospital ship, was in use during the Civil War, having been captured from the Confederates and converted at St. Louis in 1862. The Navy's first female nurses served aboard the *Red Rover*.

NAVAL HOSPITAL, HOUSTON, TEXAS

The Naval Hospital at Houston, a permanent-type structure, has capacity for 500 permanent and 500 temporary beds.

The Navy's first female nurses also served aboard the *Red Rover*. From 1863 to 1865, this ship admitted 1,697 patients, of whom only 157 died.

In 1871 the medical officers were no longer listed simply as surgeons, but as members of a staff corps of the Navy. They were given grades of medical director, medical inspector, surgeon, and passed assistant surgeon, with relative ranks, in general, to captain, commander, lieutenant commander, lieutenant, and master. Assistant surgeons on their first cruise had the "relative rank" of ensign.

The rating designation of enlisted men had meanwhile been changing through the years. The term "loblolly boy" had been succeeded, in 1861, by "male nurse." In 1843 "surgeon's stewards" appeared, and they in turn were designated as "apothecaries" in 1866. When, in 1898, the Hospital Corps was established, the foregoing personnel were incorporated into this organization. At this time, too, the second hospital ship, the *Solace,* was fitted out.

In 1883 the Museum of Naval Hygiene was founded in Washington. In 1886 the first book of *Instruction for Medical Officers,* a compilation of Navy Regulations affecting the Medical Department, was published. Editions later than the second edition, in 1906, bear the title, *Manual of the Medical Department, United States Navy.*

The rank of rear admiral was given to the officer holding the office of Surgeon General of the Navy, in 1899, and the Medical Department thus was given added prestige.

Under Surgeon General Rixey and President Theodore Roosevelt, annual physical examinations for officers, which included a specified amount of exercise, were inaugurated.

After the tremendous push given by Rixey and Roosevelt, the Medical Department kept up a steady progress through the years. In 1911, antityphoid vaccination was made mandatory and the systematic teaching of first aid was instituted. In the following year, the Dental Corps was established under the new Surgeon General, Stokes.

In 1916, the rate of hospital steward was officially changed to pharmacist's mate; the Hospital Corps was established by Congress at 3½ percent of the enlisted strength of the Navy and the Marine Corps, and any addition thereto.

World War I

During World War I, the Medical Corps rendered outstanding service to the men of the Fourth Marine Brigade, part of our Second Division, in France. At Belleau Wood, Chateau-Thierry, and St. Mihiel, wherever the Marines added glory to their battle standard, the hospital corpsmen and Medical Corps officers shared their dangers, and, in the tradition of Longshaw and Parsons, brought succor to the wounded.

In preparation for this campaign, the corpsmen and doctors trained with the ground troops from the first days at Quantico. Out of these weeks of training, an organization of medical facilities was developed—the first practical school of field medicine in the United States, which foreshadowed the later development of amphibious medicine in World War II.

World War II

In World War II, the most destructive of all wars, the Medical Department achieved a remarkable record in saving human lives. Despite the fact that bombs and high explosives produced wounds of a far more serious nature than in any previous warfare, about 97 of every 100 wounded men managed to survive. This mortality rate of less than 3 percent, compared with 11.1 percent in World War I, was due to a number of factors.

Casualty evacuation from beachheads to advanced base hospitals, a joint operation with line personnel of ships and aircraft, rapidly and efficiently completed, was a highly important contributing factor to this high rate of survival. In many cases, transport by water or air was so rapid that casualties were being operated on at a rear base hospital only two hours after being wounded. Hospital ships, for the first time, incorporated the most advanced improvements of permanent hospitals ashore, and were completely air conditioned. Air evacuation, pioneered on a large scale by Navy medical officers and hospital corpsmen attached to the Marine Corps in the early campaigns in the South Pacific, likewise ranks high among the factors resulting in such low mortality.

Without detracting from the accomplishments of the doctors, nurses, and specialists, it can be said that the hospital corpsmen, who braved death to aid the wounded where they fell, deserve the highest credit for their contribution to the achievement of the Medical Department's mission. In many cases, their casualty rate was higher than that of the troops they were supporting. The Hospital Corps won their deserved reward in the form of a Presidential Citation, the first time in naval history that an entire combat organization was cited for heroism.

The record of Jack Williams, PhM3, a Congressional Medal of Honor winner who gallantly gave his life while serving with the 5th Marine Division on

MISSION OF MERCY
Air-sea rescue PBM seaplane transports an injured machinist's mate to a naval hospital.

A FRIEND IN NEED
Navy hospital corpsman renders aid to a wounded Marine on Iwo Jima.

AIR EVACUATION
One of the reasons for the low number of fatalities from wounds in World War II. Critical cases were rushed from the combat zone to hospitals and were given medical care en route.

Iwo Jima, is typical of the courageous determination and high standards of duty maintained by the Medical Corps. While administering aid to a Marine wounded in a fierce grenade battle, Williams was struck in the abdomen and groin three times by hostile rifle fire. Momentarily stunned, he quickly recovered and continued his work unmindful of his own urgent need for medical attention. After applying dressings to his own wounds, he remained in the fire-swept area to care for another Marine casualty. Completing his task despite pain and profuse bleeding, he then endeavored to make his way to the rear in search of adequate aid for himself when struck by a Japanese sniper's bullet. He died shortly afterward, an example of heroism typical of the entire Medical Corps.

In previous conflicts in which this nation engaged, deaths of naval personnel from disease far outweighed those of enemy action. World War II reversed this ratio. The early and successful use of vaccines, antitoxins, and other preventive measures account for the unusually low disease rate among service men and civilian populations. A high standard of sanitation was maintained despite extensive operations in the Pacific area.

The effectiveness of preventive medicine is dramatically shown by the low mortality rate from disease of American combat troops on Guadalcanal, where jungles were sources of malaria and jungle fevers. Out of an estimated force of 42,000 Japanese on that island, over half perished from disease and starvation. But Americans listed as dead (from all causes) or missing on Guadalcanal totaled only 1,500.

In addition to its highly important task of caring for the wounded, the Medical Department during World War II handled an enormous case load of ordinary sickness and injuries. Some 90,000 wounded were treated, but over 50 times that number of cases of disease and noncombat injury were handled. Many new and improved methods of treatment were developed.

During World War II, the Medical Department expanded its personnel to a strength of 170,000—a total larger than the regular force of the Navy before the war. Of this number about 21,000 were medical and dental officers and 11,000 were nurses. When victory came, these skilled specialists of the Medical Department could proudly proclaim, "Mission accomplished." Thanks to their untiring efforts the Navy man had a better chance of living through the most destructive of all conflicts than in any other war in the nation's history.

THE CHAPLAIN CORPS

Establishing the Corps

The authorization for chaplains in the United States Navy dates back to the Act of March 1794 which provided for the beginnings of our present-day Navy. The first chaplain known to have received a commission was William Balch, a Congregational minister, who was commissioned on 30 October 1799. According to a law passed by Congress in 1800: "The commanders of all ships and vessels in the Navy, having chaplains on board, shall take care that divine services be performed in a solemn, orderly, and reverent manner twice a day, and a sermon preached on Sunday, unless bad weather, or other extraordinary accidents prevent it, and that they cause all, or as many of the ship's company as can be spared from duty, to attend at every performance of the worship of Almighty God." In other words, attendance at divine service was compulsory for most of the ship's company whenever such services were held aboard ship. This regulation calling for compulsory attendance remained in effect until 1862 when voluntary attendance was authorized.

Duties and Activities

From the beginning, the chaplain's major duties were and have continued to be religious. It was and is his responsibility, working under the direction of his commanding officer, to conduct divine services, to administer the sacraments of his church, to teach the principles of his religion, and to officiate at religious ceremonies. But the Navy has always given the chaplain certain collateral duties.

In the early years, chaplains usually combined teaching with the other duties of their sacred office. In fact, the records show about 60 men who served as chaplains for the duration of a cruise, and these men in all probability were not ordained clergymen. They were chosen from the ship's company and received extra pay. No doubt they read prayers at stated times. In all probability, however, they served as teachers for the midshipmen. Often the midshipmen were boys as young as twelve years. It was not until 1823 that the Secretary of the Navy ruled that chaplains should be ordained clergymen.

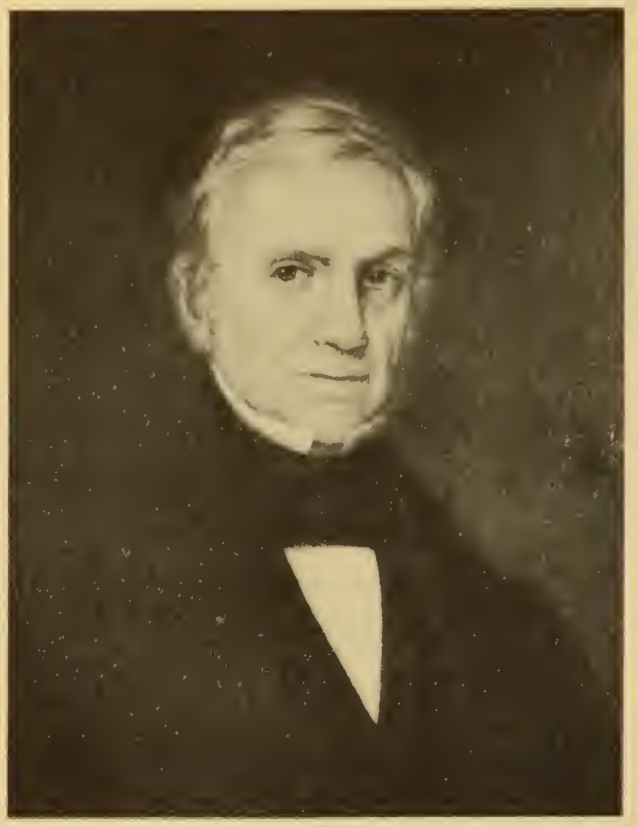
Until the Government established the Naval Academy at Annapolis in 1845, the main burden of preparing junior officers for their future duties in the Navy rested upon the chaplains. The first academy for midshipmen was in the Navy Yard at Washington, D. C., where Chaplain Robert Thompson held forth as the one-man faculty off and on during most of the first decade of the 19th century. He was followed by Chaplain Andrew Hunter who continued the "academy" for another 12 years.

There were at that time other schools for midshipmen conducted by chaplains, one of the best known being at Norfolk where Chaplain David P. Adams served for a number of years. Chaplain Adams has the unique record of having commanded three vessels which were captured from the British in the War of 1812. Among the boys who studied under Chaplain Adams was David Farragut.

In addition to carrying on their normal religious duties, Navy chaplains through the years have frequently taken the initiative in introducing reforms in the Service. Chaplains were among those who, back in the 1830's and 1840's, protested against the brutal custom of flogging. Chaplains introduced libraries aboard ships and sponsored choirs and bands. They continued to be teachers for many years even after the Academy was founded at Annapolis. Pioneers in the use of visual aids in the Navy both for instruction and amusement were chaplains. Back in 1897, Chaplain W. O. Holway used a stereopticon lantern, and in 1903 Chaplain B. R. Patrick introduced moving pictures aboard USS *Yankee*. It was Chaplain Holway who was influential in introducing calisthenics in the Navy to help keep the sailors physically fit after steam had supplanted sail. And it was Chaplain C. Q. Wright who was among the first, if not the first, to conduct sightseeing parties of sailors ashore.

Size of the Corps

Although the number of chaplains at one time, during the winter of 1806-1807, was reduced to one (Chaplain Robert Thompson at the Navy Yard in Washington), yet there had been a time since the appointment of William Balch when there were no



THE NAVY'S FIRST COMMISSIONED CHAPLAIN
Chaplain William Balch was the first chaplain to receive a commission in the United States Navy (30 October 1799).

chaplains. During the years 1821-1840 the number never exceeded nine at any one time. In 1842 Congress fixed the number of chaplains at 24 and this number remained fixed through the Civil War, the Spanish-American War, and up to the eve of World War I.

For more than a century, the chaplains worked as individuals without the benefit of a director in Washington to guide their activities. The first Chief of Chaplains, John B. Frazier, was appointed to that office on 5 November 1917. The Corps, under his leadership during World War I, grew to 203. Seven chaplains, representing five of the larger denominations, have served in this capacity.

In 1914, Congress established a quota of one chaplain for every 1,250 naval personnel. In 1947, this quota was changed to one chaplain for every 800. The number of chaplains known to have served in either the Continental Navy or United States Navy to 31 December 1945 totals 3,353.

Some Outstanding Chaplains

Through the years, a number of outstanding and colorful clergymen have made history both for the Chaplain Corps and for the Navy. During the War of 1812, several unordained men who served for a short time as chaplains actually participated in fighting. Among these was Samuel Livermore (in whose honor a destroyer was named) who served as chaplain on the *Chesapeake* under Captain James Lawrence. On 1 June 1813, the *Chesapeake* fought and lost to HMS *Shannon* just outside of Boston. Chaplain Livermore inflicted a serious wound on Captain Broke of the *Shannon* when he boarded the American vessel. Chaplain Thomas Breeze served with Commodore Perry on the *Lawrence* in the Battle of Lake Erie. He is reported to have manned a gun. However, it should be noted that these were unusual cases. Traditionally the chaplain serves in a noncombatant status. Contrary to the statement in the song "Praise the Lord and Pass the Ammunition," no chaplain manned a gun in the attack on Pearl Harbor.

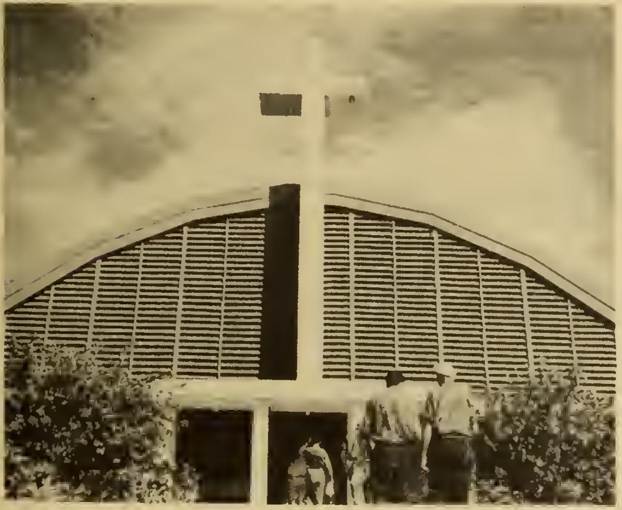
There were a number of chaplains of unusual ability and effectiveness during the 1830's and 1840's. Several were authors of note. Among these was Chaplain George Jones who accompanied the Perry expedition to Japan and conducted the first Protestant service in that country. Chaplain Jones also assisted in the exploration of Okinawa. It was Chaplain Jones who was influential in introducing coffee in the Navy. On 10 February 1842, Jones wrote to the Secretary of the Navy offering to buy coffee if the Navy "would furnish conveniences for having it prepared." His offer was accepted but soon thereafter coffee, cocoa, tea, dried fruits, and other items were included in the food ration. Chaplain Jones was the first head of the Department of English Studies at the Naval Academy and also its first chaplain.

Another outstanding Navy chaplain of this period was Walter Colton who was Commodore Stockton's chaplain aboard USS *Congress* which sailed for California in the late fall of 1845. Eight days after the United States flag was raised at Monterey on 7 July 1846, the USS *Congress* arrived at that port. Chaplain Colton was sent ashore to be alcalde (governor) and remained there for three years, the first Protestant clergyman to reside in California. He established the first American press in California and, with a partner, began the publication of a newspaper called the *Californian* in August 1846. A hall which he built is still standing (now known as Colton Hall) and here California's constitutional assembly met in 1849. He held the first trial by jury in California and also added to his fame by writing "a whole fleet of books," two of which tell about his life in California.

The first chaplain to die as the result of enemy action was Chaplain John L. Lenhart who was on board the USS *Cumberland* when she was rammed and sunk by the USS *Virginia* (formerly the *Merrimack*) at Hampton Roads on 8 March 1862, with a loss of 150 men. Even though Navy chaplains were active in the Spanish-American War and World War I, there were no casualties as the result of enemy action until Chaplain Thomas L. Kirkpatrick of the USS *Arizona* and Chaplain Aloysius Schmitt of the USS *Oklahoma* lost their lives in the attack on Pearl Harbor on 7 December 1941.

Chaplains in World War II

During World War II, Navy chaplains engaged in a great variety of collateral duties—but such duties were always secondary to their religious activities. Chaplains served as educational officers, insurance officers, editors of papers, and secretaries of Navy Relief. Some were in charge of theaters and others led orchestras and bands. Chaplains often found that as much as 80 percent of their time was taken up with consultations. Naval personnel with all kinds of problems turned to the chaplain for advice and assistance.



BUILT BY VOLUNTEER LABOR
A huge white cross marks a chapel, one of 18 constructed by voluntary labor of Navy men in the Admiralty Islands.

Navy chaplains made history in World War II. Only 192 chaplains, including 87 Reserves, were on duty on 7 December 1941. Before hostilities came to an end in August 1945, a total of 2,934 chaplains had been on duty for shorter or longer periods.

Navy chaplains were in the thick of things from the beginning of the war. Twenty-four were killed or died during the war years; 45 received the Purple Heart for wounds received in action; 5 were captured by the Japanese and of these only 2 survived; and 86 received decorations. Chaplain J. T. O'Callahan received the Congressional Medal of Honor for conspicuous gallantry aboard the aircraft carrier *Franklin* on 19 March 1945. He was the first chaplain of any branch of the Armed Services of the United States to receive this, the highest award that a grateful nation can bestow.

Six of the 25 chaplains who were on ships that were sunk as the result of enemy action lost their lives when their ships went down.

One of the many chaplain heroes during World War II was Chaplain Aloysius Schmitt who lost his life on 7 December 1941 when his ship, the *Oklahoma,* was sunk in the Pearl Harbor attack. As the ship began to roll over, Chaplain Schmitt made his way with several of the crew to a compartment which provided only one avenue of escape through a porthole. With his help, one by one the men crawled to safety. When all were outside, Chaplain Schmitt then tried to get through the small opening. It was most difficult even with the frantic assistance of the men who were on the outside. While struggling in the aperture, the Chaplain became aware of others who had come into the compartment from which he was trying to escape. Realizing that the water was rising rapidly and that even this one exit would soon be closed, Schmitt insisted on being pushed back to permit the others to escape first. He literally gave

CHAPLAIN IN SICK BAY
Obviously in high spirits, a sailor confined to sick bay chats with the chaplain.

his life that others might live, for he was drowned before he could get out.

Most of the 25 chaplains who were attached to ships sunk had harrowing experiences, along with their shipmates, from enemy planes strafing the men in the water, from sharks, and from long exposure in the water. Hundreds of chaplains served with the Marines and went ashore at Tarawa, Guam, Iwo Jima, Okinawa, and other Pacific islands won from the Japanese at the cost of blood and sacrifice. Others took part in the Atlantic theater of operations, landing with naval forces in Sicily, Normandy, and elsewhere. One Navy chaplain was stationed in the Arctic, two were in the interior of China before the capitulation of Japan, several served in Iceland and Newfoundland, and many were at shore stations in the tropics. With but few exceptions, all of the chaplains had overseas duty during the war. Literally, the Navy's chaplains were scattered with naval personnel all around the world.

Never before in the history of our nation did our Government do so much to assist chaplains of both the Army and the Navy as during the last war. Material aids such as hymn books, altar equipment, and chapels were provided. Millions of dollars were thus spent and by the time the war was over the Navy had 111 chapels at various naval installations within the United States and several at overseas bases. In addition to these, hundreds of temporary chapels were built from native materials during the war on the islands of the Pacific, often by the men themselves in off-duty hours.

A Chaplains' School for the indoctrination of Reserves was conducted during the war, first at Norfolk and then at the College of William and Mary, Williamsburg, Virginia. Here also enlisted personnel, both men and women, were trained as chaplains' assistants. A slogan used at the school read: "Cooperation Without Compromise." Chaplains of all of the major faiths proved that it was possible to work together and still to permit each chaplain to remain true to the fundamental tenets of his faith. Protestant, Catholic, and Jewish chaplains often took turns in conducting divine services in the same chapel, using much of the same equipment. In countless ways, chaplains found that they could minister to men and women of religious denominations other than their own.

All accessions to the Corps during the war entered as Reserve chaplains. Before the war ended, the Reserves numbered 96 percent of the entire Corps. Upon the shoulders of the small group of older Regular Navy chaplains fell the chief responsibility of administration. Since the Marine Corps and Coast Guard have no chaplains, these units fell within the responsibility of the Navy chaplaincy. When the war was over, most of the Reserves returned to civilian life. However, even before the war ended, the transfer of Reserves to Regulars had begun. A total of 224 transferred from March 1944 to September 1946. At the end of 1946, the Corps still had 192 Reserves on extended duty. By the summer of 1948, the Chaplain Corps numbered about 450 Regular and Reserve chaplains on active duty. The Corps was then below its authorized strength and was slowly building up its numbers by new procurement.

THE NAVAL RESERVE

Mission and History

The mission of the Naval Reserve is to provide a force of qualified officers and enlisted personnel who are available for mobilization in a national emergency and who, together with the active and retired personnel of the Regular Navy, can effectively meet the needs of the expanding Naval Establishment while an adequate flow of newly trained personnel is being established (Article H-1101 of the *Bureau of Naval Personnel Manual*).

The Naval Reserve is a gradual development of the Naval Militia of various states. As far back as 1887 a bill was introduced in Congress for the creation of a Naval Reserve. While this legislation was not enacted into law it, however, became the basis of action by several states in creating Naval Militia Organizations. By 1897 fifteen states had such organizations with a combined strength of 3,700 officers and men. The war with Spain brought attention to the need for an organized Reserve force. As a result of the experience in this war, the lack of a reserve force for the Navy was emphasized and continuous pressure was maintained for the establishment of an effective Naval Reserve under federal control.

The first authorization for a Naval Reserve, to be composed of ex-Navy men, came in 1915. Various changes occurred in enactments affecting the Naval Reserve Program in the years following the close of World War I. The Naval Reserve Act of 1925 established the Naval Reserve on much the same basis as it is today.

During 1928 an intensive program was inaugurated for the building up of the Merchant Marine Reserve

RESERVES SERVED IN EVERY THEATER OF WAR
Many Reserves served in the Armed Guard, manning the guns of merchant ships.

which had become depleted after the close of World War I. Naval Reserve officers with experience in the shipping industry were assigned to active duty and devoted their entire time to this program.

After the enactment of the Naval Reserve Act of 1925, further legislation was needed to make the Naval Reserve Act of 1925 of greater benefit to the Navy and to utilize it as a potent force in the event of war or a national emergency. The Naval Reserve Act of 1938 repealed the former Act and provided such additional support that, should the Reserve be mobilized for war, a well-trained organization will take its place with the Regular Navy.

World War II was preceded by several years of tense international relations during which time the growth of the Naval Reserve reflected the rising anxiety of the people. The organized divisions were particularly well qualified to take their place in the line of the Navy.

By amendments to the Naval Reserve Act of 1938, women, including nurses, became part of the Reserve.

The purpose of this section is not to recount the great accomplishments of the Naval Reserve in World War II, nor to describe the complex program that made possible those achievements, but to present the Naval Reserve Program as it is today.

Administration and Composition

The over-all responsibility for the Naval Reserve Program is vested in the Chief of Naval Operations in the same manner as is his responsibility for the Regular Navy. The commandants of naval districts, river commands, and the Chief of Naval Air Reserve Training, under the supervision of the Bureau of Naval Personnel and other bureaus and offices concerned, are charged with the administration, procurement, training, and readiness of the Naval Reserve under their jurisdiction.

The Naval Reserve consists of four principal components: (1) the Organized Reserve, (2) the Volunteer Reserve, (3) the Merchant Marine Reserve, and (4) the Fleet Reserve.

The *Organized Reserve* consists of officer and enlisted personnel who are required to maintain efficiency by attending frequent drills and performing annual training duty. Pay is provided for participation in the Organized Reserve.

The Organized Reserve consists of the Surface (including Submarine) Program, the Aviation Program, and special programs. The latter includes Intelligence, Communications Supplementary Activities, Naval Transportation Service, Construction Battalion, Ship Repair, and Cargo Handling Programs.

The basic unit for the surface component of the Organized Reserve (including Submarines) is the Division. A Division is under the command of a senior Reserve officer who is normally a lieutenant commander.

Two to four Divisions are combined to form a Battalion if its establishment will result in increased training and administrative efficiency. This is especially true in the larger cities where it is necessary to have more than one Division. The Battalion is under the command of a Reserve line officer who is normally of the rank of commander. The relation of the Battalion Commander to his Division Commanders is analogous to the relationship existing between a Division Commander afloat and the commanding officers of the ships in his Division.

In densely populated cities where multiple Battalions are located a Brigade is established. The Brigade Commander is a Reserve line officer normally of the rank of captain. The Brigade Commander will bear the same relation to the Battalion Commanders within the Brigade as exists between a Squadron Commander afloat and his Division Commanders.

The "tour of duty" of commanding officers of all units will normally not exceed 3 years to provide for "fleeting up" of junior officers

The Squadron is the basic organizational unit of the aviation component of the Organized Reserve. The Squadron Commander is the Reserve senior naval aviator.

The composition of each organization of the Naval Reserve is governed by Tables of Organization approved annually by the Secretary of the Navy and promulgated by the Chief of Naval Personnel.

The purpose of the *Volunteer Reserve* is to provide a force of officer and enlisted personnel which, when added to those of other branches of the Naval Reserve, will meet the needs of the Navy until an adequate flow of newly trained personnel is established.

Personnel of the Volunteer Reserve are normally

INVASION FLEET
Ships of several types, some manned almost entirely by Reserves, lie at anchor in an Aleutian harbor just prior to landing on Kiska.

instructed and trained as individuals through the medium of correspondence courses and training courses. When funds are available, training duty is authorized. Within prescribed quotas Volunteer Reservists may associate with Organized Units. For instruction purposes Volunteer Reservists may be formed into Volunteer Units. Reserve personnel not having membership in any unit are administered as a pool directly under the commandants of the naval districts.

Personnel of the *Merchant Marine Reserve* are seagoing personnel who have followed, now follow, or are training to follow the sea as a profession. It also includes those men ashore who are engaged in the seagoing profession. For the most part, employment in their civilian occupation replaces the training given other Reservists.

The *Fleet Reserve* is composed of ex-officers and ex-enlisted men of the Regular Navy. In the initial stages of mobilization they may be utilized without further training to fill those billets requiring experienced personnel. Enlisted Fleet Reservists may be required to perform active duty not to exceed 60 days in any 4-year period.

Classification, Instruction, and Training

The assignment of Reserve personnel to duty according to their skills and training is one of the problems of mobilization in time of an emergency. To facilitate such assignments both officer and enlisted personnel of the Naval Reserve are classified according to their civilian skills, schooling, and adaptability for the Naval Reserve. The classification in the case of officers is evidenced by a service designator which denotes their specialization. Enlisted personnel are given a Navy Job Code.

The mission of the Naval Reserve can be attained only through the constant and effective training of its personnel. The following types of training are provided:

(a) Regular drills
(b) Annual training duty
(c) Appropriate duty
(d) Equivalent instruction or duty

Regular drills consist of training in duties pertaining to the Navy and may be not less than 2 hours' duration. All units of the Organized Reserve, except those of the Aviation Program, conduct drills at Naval Reserve Training Centers (formerly Armories). Units of the Aviation Program conduct drills at various air facilities under the cognizance of the Chief of Naval Air Reserve Training. Where practicable, units of the Volunteer Reserve share these facilities.

Annual training duty is of 2 weeks' duration. This duty is conducted aboard Navy vessels or at naval shore activities, depending upon the Reservist's rank or rate and classification.

Appropriate duty is prescribed for Reserves not attached to organizations and consists of any duty which is commensurate with the rank or rating of the individual concerned. Each period of such duty must be of not less than 2 hours' duration.

Equivalent instruction or duty for officers and enlisted personnel attached to drilling units consists of practical or theoretical instruction, other than group training, which the commanding officer deems essential for their training. The training periods must be not less than 2 hours' duration. Correspondence Courses are available to Reserve personnel. Although these courses are designed for Reserve officers they are available to qualified enlisted personnel.

Promotion

For purposes of promotion each officer of the Organized Reserve, Volunteer Reserve, and the Merchant Marine Reserve will have a running mate who is a line officer of the Regular Navy next junior to him. Officers will become eligible for consideration for promotion when their running mates in the Regular Navy become eligible for promotion provided they pass the required professional examination or correspondence studies in lieu thereof, and meet the prescribed requirement regarding performance of drills and training duty. For all grades above lieutenant (junior grade), promotion will be by selection. This selection will be based upon a comparison of their qualifications for selection.

Enlisted personnel attached to organizations may be advanced to fill vacancies in allowances prescribed for the organization to which they are attached. They must, however, fulfill certain minimum "service in grade" requirements of the various pay grade levels, satisfactorily complete required professional examinations, participate in annual training cruises, and be recommended for advancement by their commanding officer. Members of the Naval Reserve, although in a completely inactive status, may be advanced in rating. For information regarding requirements such personnel should address their commanding officer who, in each case, is the commandant of their naval district.

Addresses, Records, and Reports

Home of record is defined as being that address which only Reserve officers may maintain for personal reasons and, in general, is that address to which they would normally expect to be returned after a tour of duty. Any change in this address must be reported to the Chief of Naval Personnel via official channels. If the officer concerned is not on active duty, such notification must be forwarded via the custodian of his record.

Present address is defined as the place of actual residence or location at which a Reservist (officer or enlisted) can be reached at any time by orders or other official correspondence, with a certainty of delivery.

Officers and enlisted personnel of the Naval Reserve must report any change in their "present address" to their commanding officer. Reservists not attached to an organized unit must report their change of address to the commandant of their district.

Naval Reserve officers and all Fleet Reservists are required to take a physical examination every 4 years. In addition, examinations are required for active duty, training duty, and promotion.

Enlisted personnel must be physically examined when enlisting or reenlisting, and upon reporting for active or training duty.

When not mobilized or when on inactive duty Naval

Reservists are required to obtain permission from the commandant to leave the United States for periods in excess of 30 days, otherwise permission must be obtained from the Chief of Naval Personnel.

Reservists employed in the United States merchant vessels or in American owned vessels under friendly foreign registry, or engaged in flying aircraft of commercial air lines of the United States will not be required to obtain permission to leave the United States while following their profession.

UNITED STATES COAST GUARD

Headquarters

The Commandant of the Coast Guard directs the administrative affairs of the Coast Guard and maintains his office in Coast Guard Headquarters in Washington, D. C. The Headquarters is organized on a functional basis. In addition to the Offices of the Commandant and Assistant Commandant, there are the Planning and Control Staff and Offices of Engineering, Finance and Supply, Merchant Marine Safety, Operations and Personnel, as well as five divisions including Headquarters Administration, Inspection, Intelligence and Law Enforcement, Legal and Public Information. Each of the Coast Guard districts in the United States, its territories, and possessions operates under a district commander who is under the supervision of the Commandant.

Establishing of the Coast Guard

Created by Act of Congress on 4 August 1790 at the request of the first Secretary of the Treasury, Alexander Hamilton, as a seagoing service in "10 boats" to be employed "for the security of the revenue," the Coast Guard was variously known by such names as the Revenue Marine, Revenue Service, and Revenue Cutter Service. As early as 1799, Congress provided that the cutters should, whenever the President directed, cooperate with the Navy. On 28 January 1915, the President signed a law consolidating the Life Saving Service and the Revenue Cutter Service, both of the Treasury Department, into a single service of the Treasury under the name of the Coast Guard. By this law, as amended, the Coast Guard is a military service and constitutes a branch of the land and naval forces of the United States at all times. It operates under the Treasury Department in time of peace, and as a part of the Navy, subject to the orders of the Secretary, in time of war or when the President so directs.

Early Accomplishments

As time went on, the Revenue Marine found itself invested with many other duties besides enforcing the revenue laws. The enforcement of the state quarantine statutes, the suppression of piracy and the slave trade, the enforcement of the neutrality laws and of the immigration laws, and even the protection of national live oak timber in Florida, vitally needed for naval construction, became part of its manifold undertakings.

Eight vessels of the Revenue Marine were assigned to cooperate with the newly organized Navy in 1798 in the Quasi War with France.

To enforce President Jefferson's 1807 embargo, 12 new vessels were authorized in 1809, and these helped to carry the naval burden in the War of 1812. In this war, the Revenue Marine helped to protect our coasting trade by providing convoy between ports; it attacked or warded off attacks of privateers and armed flotillas sent out by British squadrons ranging freely along our coasts; and it captured hostile armed merchantmen.

In 1832, five vessels of the Revenue Cutter Service were ordered to Charleston to prevent nullification of the revenue laws until Henry Clay's Compromise Act of 1833 removed all immediate threat of such action.

When the Seminole War broke out in 1836, eight revenue cutters cooperated with the Army and Navy in blockading rivers, carrying dispatches, transporting troops and ammunition, and providing landing parties for the defense of settlements menaced by the Indians.

Eleven cutters participated in the Mexican War from 1846 to 1848, principally in cooperation with the armies under Taylor and Scott, although two vessels served under Commodore Perry.

In 1849, Captain Frazer, the first military commandant, found San Francisco a difficult station with

INTERNATIONAL ICE PATROL
Coast Guard participates in this international job of minimizing navigational perils.

the inrush of the gold-seeking '49-ers. There were some 600 vessels riding at anchor, many with insubordinate and lawless crews. As yet there were no civil tribunals and Captain Frazer and his aides worked day and night enforcing the revenue laws and helping shipmasters suppress mutiny and violence.

Life Saving Service. One of the Coast Guard's major activities has always been the assisting of vessels in distress and the saving of life and property at sea. Andrew Jackson's Secretary of the Treasury first designated the Revenue Marine for this duty in 1831 when he detailed seven cutters to patrol areas near their stations and perform such functions. The first appropriation for saving of life from shore was made by Congress in 1847. At Spermaceti Cove in New Jersey one of the first stations built with federal funds still stands.

Slowly but steadily this service developed. After 1849 more boathouses and equipment were provided by congressional funds; in 1854 the appointment of keepers at $200 a year was authorized; and finally in 1871 Congress authorized the Secretary of the Treasury to employ experienced surfmen at these stations and a governmentally supervised system began to replace the former loosely organized service. By 1874, there were life-saving stations in many points along the coast of New England, the South Atlantic and Pacific coasts, and the Great Lakes. Life-saving medals were authorized, personnel matters reorganized, beach patrols and signals introduced, and the technique of using the breeches buoy developed. Masters of American ships were required to notify customs collectors in their home district regarding the nature and probable causes of marine disasters. In 1818, the Life Saving Service was established as a separate bureau of the Treasury. Officers of the Revenue Cutter Service were assigned to inspect, drill, and discipline the crews of the life-saving stations. Through the combined efforts of the two services, over 200,000 lives were saved in the years between 1871 and 1941 as well as property valued at over a billion dollars.

War Between the States

It is claimed that the *Harriet Lane*, a revenue cutter, fired the first shot in the Civil War. Her captain ordered a shot across the bow of the steamer *Nashville*, lying off Charleston bar and waiting to run in just before the bombardment of Fort Sumter in April 1861.

This war divided the allegiance of the Service. When the captain of the cutter *Lewis Cass*, stationed at Mobile, turned over his ship to the Confederacy, Third Lieutenant Charles F. Shoemaker, who later became Commandant, determined to remain loyal to the Union and made his way north as best he could with his brother officers and the entire crew.

The *Harriet Lane* participated in the bombardment of Fort Sumter, and also took part in the attacks on Fort Clark and Fort Hatteras. The *Miami* was Lincoln's personal transport from which he landed to reconnoiter on Confederate soil the night before the capture of Norfolk. Other cutters rendered important services in the waters of North Carolina and cooperated with the naval forces in the gunboat flotilla in the Chesapeake.

Activity from 1865 to 1917

Following a post-war wave of economy and reduction in personnel, a new set of service regulations was issued in 1871. These required that expenditures be authorized from Washington, that cutter reports and inventories be made regularly to the Revenue Marine Bureau, and that all cutters be inspected periodically. Such measures were designed to insure a more efficient functioning of the Service.

COAST GUARD BUOY TENDER
Keeping the channels safe for shipping is an important Coast Guard activity.

In 1876, organized training was initiated. In that year, Congress provided for the appointment of cadets to fill the lower commissioned ranks and the first training ship, the *Dobbin,* was outfitted as a floating school of instruction. Two years later, the school was removed to the more modern *Chase* which in 1893 established winter quarters at Curtis Bay, Maryland. In 1907, the *Chase* was superseded by the *Itasca,* and in 1910 the school was moved to Fort Trumbull, New London, Connecticut. In 1932, the Coast Guard Academy was established in a new building farther up the Thames River at New London.

A revenue cutter, the *Lincoln,* was the first American vessel to arrive in Alaska following our purchase of that territory from Russia in 1867. Regular patrol work began in Alaska as early as 1880 when the cutter *Corwin* was assigned to general police duty in the Bering Sea. From the beginning, Alaska was the particular responsibility of the Coast Guard. Its cutters were in Alaskan waters from early May until late December each year, rendering aid to shipping, caring for the shipwrecked, and assisting the unfortunate and destitute natives. Public Health surgeons detailed to the cutters of the Bering Sea Patrol prescribed for and aided the sick. Shipwrecked American whalers were rescued and brought home to the United States.

Thirteen cutters, cooperating with the Navy, took part in the Spanish-American War; eight were with Sampson's fleet on the Havana blockade, one was with Dewey's fleet, and four worked with the Navy on the Pacific Coast.

The International Ice Patrol was initiated by the United States in 1912, following the sinking of the *Titanic* by collision with an iceberg. The Coast Guard has conducted this activity since 1913, except for the period during World War II when it was suspended. Its purpose is to locate icebergs and field ice nearest to trans-Atlantic lanes of ocean travel and to warn vessels of their location.

Coast Guard in World War I

On 6 April 1917 when we declared war on Germany, the Navy was augmented by 15 cruising cutters, over 200 commissioned officers, and 5,000 warrant officers and enlisted men. They were entrusted not only with the hunting of submarines and raiders, but also with guarding the transport of troops. A squadron of Coast Guard cutters was based at Gibraltar, performing escort duty between that port and the British Isles. The cutter *Tampa*, bound for Milford Haven after escorting a convoy to Gibraltar, disappeared during a storm on the night of 26 September 1918, leaving no trace other than some floating wreckage. Over 100 Coast Guardsmen were among the 130 persons lost. In proportion to its strength, the Coast Guard suffered the highest losses of any of the Armed Services in World War I.

Developments Between Wars

Following World War I, the experiment of Prohibition added many problems to the Coast Guard's work of preventing smuggling. While enforcement of the unpopular law was unpleasant and often dangerous, funds were allotted for expansion to an extent never before equalled. The Service was augmented and greatly improved, especially in the fields of communication and intelligence. With repeal of the 18th Amendment in 1933, considerable reduction in activities took place. A reorganization followed, one phase of which was decentralization of authority among the districts, resulting in increased efficiency of the Service.

On 1 July 1939, the Lighthouse Service of the Department of Commerce was transferred to the Coast Guard. Its functions are the construction, operation, maintenance, repair, illumination, and inspection of all aids to navigation, including lighthouses, lightships, buoys, beacons, fog signals, and daymarks.

· The Coast Guard was directed in 1936 to keep channels and harbors open by means of icebreaking, in accordance with the reasonable demands of commerce, and in 1940 established an Atlantic Weather Observation Service, patrolling certain weather stations—areas 100 miles square between Bermuda and the Azores for protection of the rapidly increasing trans-Atlantic air commerce.

In 1939, Congress created the Coast Guard Reserve, later (1941) known as the Auxiliary, when a military reserve was established. This first Reserve was a voluntary nonmilitary organization intended to train and instruct those using the high seas and navigable waters of the United States. Another purpose was to secure the cooperation of yachtsmen and other small-boat owners in the observance of the laws and the adoption of safety devices on their boats. Later some 3,000 of these Reservists with their boats became available as coastal pickets when enemy submarines began to prey on our coastal shipping.

When the President proclaimed our neutrality on 5 September 1939 in the war which had broken out in Europe, the Coast Guard assumed a wide field of responsibility in the prevention of unneutral acts by merchant vessels. A systematic and extensive patrol by aircraft, vessels, and coastal stations was carried out all along our coasts. Radio apparatus aboard merchant vessels of belligerent nations, while within our waters, was inspected and sealed.

On 27 June 1940, the President invoked by proclamation and delegated to the Secretary of the Treasury his powers under the Espionage Act of 1917. These powers included the right to govern the anchorage and movement of all vessels in United States waters, to inspect them and place guards on them, to secure them from damage or injury and prevent damage to harbors and waters of the United States; also to take full possession and control of them, removing the officers and crew and all other persons not specifically authorized by him to go or remain on board. Shortly afterward, the Dangerous Cargo Act gave the Coast Guard, jointly with the Bureau of Marine Inspection and Navigation of the Department of Commerce, wide jurisdiction over every vessel on the navigable waters of the United States carrying certain high explosives or other dangerous cargo. This marked the beginning of the wartime Port Security activities of the Coast Guard designed to protect navigable waterfront property and the shipping which annually utilized it.

ALWAYS READY
Coast Guardsmen are vigilant on land or sea. They are entrusted with the guarding of many vital security posts.

The Coast Guard Auxiliary and Reserve Act of 1941 established the Coast Guard Regular and Temporary Reserve which, during the war years, grew to a considerable number. Numerous Volunteer Port Security Forces were organized by Temporary Reservists in all the major ports to guard wharves, shipyards, and waterfront property on a part-time basis and with all services donated to the Government.

On 11 September 1941, all units, vessels, and personnel of the Coast Guard previously transferred to, or under detail to the Navy, and such additional units, vessels, and personnel of the Coast Guard as were agreed upon, were ordered to operate as part of the Navy. Finally, on 1 November 1941, the entire Coast Guard was ordered to operate as part of the Navy. Coast Guard districts automatically went under control of the naval districts in which they were located. On 30 March 1942, the Coast Guard was designated as a Service of the Navy Department to be administered by the Commandant of the Coast Guard under the Secretary of the Navy in accordance with general directives issued by the Secretary and by the Commander in Chief and Chief of Naval Operations. Before the declaration of war, the larger cutters and patrol boats capable of offshore operations had been assigned to the fleet, to sea frontiers, or task forces for convoy, antisubmarine, and patrol duty.

Coast Guard in World War II

Shortly after the declaration of war on 8 December 1941, Coast Guard vessels got into action. On 9 May 1942, the cutter *Icarus* sank a German U-boat while proceeding southward from New York on a routine run and took 33 prisoners, including the submarine's commanding officer. The cutter *Campbell* was the next Coast Guard vessel to register a definite kill in the gruelling antisubmarine war. On 22 February 1943, while on convoy escort duty in mid-Atlantic, she rammed and sank a submarine and picked up five survivors. Information in German and Japanese records, access to which was had after the close of the war, confirmed the sinkings by Coast Guard vessels of seven enemy submarines.

COAST GUARD CUTTER CONTACTS ENEMY SUBMARINE
A depth charge is fired from the K-gun of a Coast Guard combat cutter as the U-boat dives for safety.

FIRST ASSAULT WAVE DEBARKS IN LINGAYEN GULF
A Coast Guard manned invasion transport carries troops to the beach.

The Coast Guard acquired a number of civilian craft that were capable of remaining at sea for at least 48 hours at cruising speeds. These boats carried some torpedoes, at least four, and were armed with machine guns. Equipped with a radio, they functioned as coastal pickets and their duties were to observe and report actions of all hostile submarines, surface craft, and air forces, and to attack and destroy when their armament permitted. They also conducted rescue operations offshore, reporting all vessels in distress, survivors located, and any other observations made of matters that might be of interest to the Navy.

New scientific developments aided the Coast Guard in performing wartime duties. In addition to loran and radar, racon and anrac were utilized. Racon, a fixed frequency transponder that gives distance and bearing within 120 miles of a plane or ship, can be used for coastwise piloting in peace. Anrac is a radio device that lights and extinguishes electrically lighted unattended beacons and operates fog signals.

During 1942, Coast Guard floating units of 65 feet or longer increased in number from 3,732 to 8,357. This expanded fleet, together with the Coast Guard's regular cutters, brought in over 1,500 survivors of enemy torpedoings along the Atlantic Coast, Gulf of Mexico, and in the Caribbean. They were assisted by Coast Guard planes which numbered around 200 during the war. Lifeboat stations along the Atlantic Coast picked up hundreds of survivors in lifeboats after they had been spotted by Coast Guard aircraft on the antisubmarine patrols off the coasts. The aircraft guided fishing vessels and other craft to submarine victims in the water. By June 1942, the sinkings of merchant vessels and tankers along our coasts were becoming less frequent. Enemy submarines were now operating against our ocean convoys which were carrying troops and supplies to Europe and the Southwest Pacific in preparation for the amphibious landings soon to begin in both these theaters. As the submarine menace along our coasts subsided, most of the 24,000 Coast Guardsmen that had been patrolling 40,000 miles of our coast were released for sea duty, while the Temporary Reservists and Spars relieved many others for more active service in the front line of amphibious and antisubmarine attack.

BEACH PATROL
A Coast Guardsman burns a flare to indicate to a vessel in distress that help is coming.

COAST GUARD RESCUES DOWNED PILOT
A Coast Guard PBY from an air-sea rescue unit saves a Navy pilot from death.

A total of 351 Navy vessels were manned by Coast Guardsmen. These included destroyer escorts, troop transports, cargo vessels, tankers, and a variety of patrol craft. Their experience in surf landings especially fitted them to man landing craft that brought men and supplies to hostile beaches. In addition, many other types of Navy ships had Coast Guardsmen in their crews. The Coast Guard also manned 291 Army vessels, including freight and supply vessels, large tugs, tankers, and freight boats which constituted supply echelons for Southwest Pacific and Philippine Army bases. Out of a total of 1,035 Coast Guardsmen who died abroad, 572 were killed in action. Altogether over 1,800 died in the war.

Return to Peacetime Duties

The Coast Guard was returned to the Treasury Department on 1 January 1946. At the same time, wartime Port Security ended, and the Coast Guard continued to enforce recodified regulations on a peacetime basis. Air Sea Rescue, inaugurated in 1939 and developed during 1943 to 1946, was renamed Search and Rescue and is being maintained as a regular peacetime function of the Coast Guard and integrated into a system of constantly alerted communications, coastal lookout stations, and patrols to institute instant and systematic search and rescue procedure in case of maritime disaster.

Enforcement of various conservation laws and navigation laws is carried on by the Coast Guard. A few such laws are the Songe Fishing Act, the Deep Sea Sealing Act, the Inland Rules of the Road, the Motorboat Act, regulations covering the obstruction of navigable waters, the anchorage and movement of vessels, and general law enforcement on the high seas and navigable waters of the United States. Other laws enforced are those regulating the transportation of dangerous cargo, prohibiting the transportation of certain banned commodities, and the Submarine Cable Act.

During the war, the President temporarily transferred to the Commandant of the Coast Guard certain safety-at sea functions of the former Bureau of Marine Inspection and Navigation of the Department of Commerce. These dealt principally with the safety features of ship construction and repair, and with safety equipment; with the enforcement of disciplinary controls over Merchant Marine personnel, exercised by hearing units set up in major ports at home and abroad; and with enforcement of the responsibilities of ship owners and officers after accidents. On 16 July 1946, this transfer was made permanent.

On 1 May 1947, two Ocean Weather Stations were being maintained in the Atlantic and two in the Pacific, furnishing weather data to the Weather Bureau, acting as plane guards, furnishing radio-beacon service, and rendering assistance to vessels in distress. With the acceptance of our responsibilities under the Provisional International Civil Aviation Organization (PICAO), the number will be increased to seven in the Atlantic, with the maintenance of another being shared with Canada.

The extensive system of Coast Guard owned and operated telephone lines and submarine cable, together with 20 radio traffic stations and 11 air radio stations, lighthouses, and other units, is smoothly coordinated to handle maritime disasters of any character or extent. Medium-frequency radio direction finder facilities were discontinued as a navigational aid, owing to the use generally of shipboard direction finders in conjunction with marine radio-beacons, but were continued at strategic points for search and rescue purposes only. Two high-frequency direction finder stations out of some 27 used during the war remained in commission as of 30 June 1946.

The International Service of Ice Observation and Ice Patrol in the North Atlantic on its resumption in 1946 utilized radar and aircraft for the first time to supplement the work of the patrol vessels in locating icebergs and in determining the limits of ice fields from the air.

On 1 March 1947, the Coast Guard's military personnel consisted of about 2,400 commissioned officers, 600 warrant officers, and some 250 cadets. There were over 18,000 enlisted men.

THE UNITED STATES MERCHANT MARINE

Importance of Merchant Shipping

A nation's merchant ships are an important part of her sea power. Our recognition of this fact is expressed in this portion of the Merchant Marine Act of 1936:

> It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a Merchant Marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in the time of war or national emergency. . . .

Merchant ships are far more than a means of transportation. They make the entire world a market

MERCHANT MARINE JOINS CONVOY TO BATTLE FRONTS
Cargo ships fill the sea lanes, bearing guns, tanks, and planes. Two liberty ships are visible in this section of convoy somewhere at sea.

for the products of our factories and farms, thus contributing to our economic well-being. They bring back to our ports the materials that we lack, and that are essential to our industries. Their visits to remote ports convey American ideas and ideals to nations who otherwise might have only their statesmen's warped, distorted concepts of our people.

During a war, merchant shipping provides a vital link between the fighting force overseas and the production army on the home front. In World War II, Allied sea power, despite keen and intelligent opposition by the enemy, kept the United Nations supplied with, and the enemy denied access to the raw materials and manufactured products necessary for victory.

The German U-boat warfare in the Atlantic had as its primary target the ships that were bringing to England the supplies without which she could not survive; our undersea war against the Japanese in the Pacific did much to hasten the end of the conflict by virtually abolishing the enemy's merchant fleet.

The Navy and the Merchant Marine

A concise expression of the relationship existing between the United States Navy and the Merchant Marine is contained in the following quotation from a letter written in 1932 by Charles Francis Adams, then Secretary of the Navy:

> . . . The Navy and the Merchant Marine are joined by an inseparable relationship. Each is indispensable to the other and each is inspired by the fine traditions of the sea. Throughout our history as a Nation they have been cherished with just pride by our people.

In a time of national emergency the Merchant Marine supplements the Navy as an arm of national defense. Merchant vessels become naval cruisers and naval auxiliaries for the transport of troops, munitions, fuel, and supplies necessary to the support and maintenance of naval and military units. The Merchant Marine constitutes a reserve from which a body of trained seagoing men are available to augment the personnel of a naval fleet.

Development of the Merchant Marine

American merchant shipping has experienced some extreme stages of expansion and decline. It flourished in the early days of the republic while Europe was at war. Its peak was reached in the 1850's, due in part to the superiority of American-built clipper ships. However, following the Civil War, a period of decline started, brought about by two factors: Our expansion at this time was inland, so that capital shifted away from shipping. Britain was better equipped to build iron-hulled steamships and during this period constructed them in large numbers. The combined result of these factors was that at the start of World War I our tonnage was less than 10 percent of that of Britain. While our exports and imports continued to grow, most of them were carried in foreign merchant ships.

World War I brought about a brief, frenzied attempt to remedy this situation, and as a result of the increased shipbuilding during this time, the period from 1917 to 1921 saw us with a gross tonnage of 11,000,000. But many of these vessels were soon scrapped or laid up, and those that we kept in service were inferior to the merchant ships of foreign powers. The latter were faster, better ships and their rates for carrying freight were far lower than the American companies could offer, partly because of the higher wages paid to American seamen. One permanent achievement in this period, however, was the establishing of a network of subsidized American lines to the principal ports of the world.

The 1928 Act was an attempt to lessen this disparity, but it failed to bring any substantial amount of new capital into American shipping. It was not until 1936, when Congress passed the Merchant Marine Act providing for the creation of the Maritime Commission, that American ship owners were encouraged to consider expansion.

The United States Maritime Commission

The creation of the Maritime Commission awakened interest in merchant shipping. Immediate results of the Commission's activity became apparent with the building in 1937 of 50 fast, good-sized cargo ships. Production continued annually at this rate until 1941 when the Japanese attack on Pearl Harbor shifted shipbuilding into high gear.

The Maritime Commission was established principally to direct the national phases of merchant shipping and shipbuilding, and by 1941 it had made considerable progress in preparing the national defense aspects of the Merchant Marine, particularly in the field of shipbuilding. To offset heavy submarine losses, nearly 2,000 large, but relatively slow Liberty ships were turned out, principally in new, improvised yards.

In addition, many faster ships designed under the Maritime Commission's long-range policy had been built by shipyards encouraged by the nation's new maritime program. Building schedules had already been stepped up. Close cooperation with naval authorities had resulted in types of ships ready for fast production and designed to meet the auxiliary needs of the United States Navy and to fit war-use specifications.

It was soon apparent that the immense shipbuilding phase of its duties would be a full-time job for the Maritime Commission and that an agency was needed to handle wartime merchant fleet operational problems. Such an agency, the War Shipping Administration (WSA), was formed in February 1942.

The War Shipping Administration

The Chairman of the United States Maritime Commission was named as War Shipping Administrator and he was directly responsible to the President of the United States. His agency, the War Shipping Administration, was empowered to control the operation, purchase, charter, requisition, and use of all ocean vessels under the flag or control of the United States, except for those of the Armed Services and those limited domestic water-borne services under the Office of Defense Transportation. Prior to the establishment of WSA, cooperation by American ship operators in the transport of military, lend-lease, and other cargoes had been principally on a voluntary basis. The Maritime Commission had supervised and directed movement of both import and export cargoes, but the active participation of the United States in the war called for total government control of all ocean-going tonnage.

The responsibility of the WSA included the purchase or requisition of vessels for its own use or for use by the Army, Navy, and other government agencies; the repairing, arming, and installation of defense equipment on WSA-controlled vessels and Allied vessels under lend-lease provision; the conversion of vessels to troop transports, hospital ships, and for other special purposes; the training and providing of ship personnel; the operation, loading, discharging, and general control of the movement of the ships; administering of marine and war-risk insurance laws and funds; and the control of port and terminal facilities, forwarding, and related matters. With all merchant ships subject to WSA requisition, qualified ship operators became operating agents for the United States Government. Thus, although the American maritime industry was placed under wartime orders, it remained intact in its organization.

The War Shipping Administration also cooperated with other Allied countries in utilizing most effectively all Allied shipping. The Combined Shipping Adjustment Board was formed with Great Britain, to act as a coordinating agency for maximum utilization of these two powers' shipping facilities.

Accomplishments in World War II

The full story of the accomplishments of the Merchant Marine in World War II is related in *The United States Merchant Marine at War*, source of much of the material in this section of NAVAL ORIENTATION. This is the report submitted in January 1946 to the President of the United States by Vice Admiral Emory S. Land, Chairman of the Maritime Commission and War Shipping Administrator. Space does not permit a detailed account of the work of the Merchant Marine during the war, but even the brief summary given here will serve to illustrate the great scope of its activity.

The summit of Merchant Marine achievement was attained in the hazardous Murmansk Run. The war

TRUCKS FOR CHERBOURG
Liberty ship's boom lowers heavy truck to deck of a rhino off Cherbourg.

SS *URUGUAY*
The *Uruguay* was one of many merchant ships converted into a troop carrier during World War II.

with Japan prevented full use of our World War I shipping lane to Russia through the port of Vladivostok; the Mediterranean was long since closed as a gateway to Russian ports; into the Persian Gulf meant the long voyage around the Cape of Good Hope. The most direct route was through the Straits of Denmark between Iceland and Greenland, then around the North Cape of Norway into Murmansk. This, then, was the Murmansk Run, a voyage that combined all the elements of danger from man and nature alike. But the slow, gray convoys made that trip, through icy, fog-bound seas where they were exposed to attack by dive bombers, surface raiders, and submarines moving out from the Nazi-held fjords of Norway. Even after they had reached their destination and were unloading their cargo, they were subjected to attack by planes of the Luftwaffe.

The Merchant Marine carried cargoes across every ocean. The distribution in 1944 was: 15 million tons to the United Kingdom and the continent of Europe; 13 million tons to the Pacific; 8 million tons to the Mediterranean area; 6 million tons to South America and the Caribbean; 5 million tons to the USSR; and 3 million tons to India and Ceylon.

Their cargoes were as varied as the sea lanes they traveled, and ranged in size from pins to locomotives. They carried planes, tanks, and landing craft; fuel and ammunition; drugs, medicine, and hospital supplies; food and clothing, and many more items too numerous to mention.

First priority was given to Army and Navy needs, but exports were also carried for the Lend-Lease Program. Shipments of goods were carried for the Allies and deliveries were made in many Latin-American countries. Strategic materials were sometimes brought back in these ships, as were goods that were considered essential for civilian use.

The Ships

By the end of the war with Japan, the WSA-controlled fleet numbered 4,221 ships, with a tonnage of nearly 45,000,000. About 75 percent of the vessels under WSA control consisted of the well-known Liberty ships, which are comparatively slow, having a speed of about 11 knots. Construction of the Victory ships began in 1944 when turbines became available for merchant ships. The Victory ship has about the same tonnage as the Liberty (about 11,000 tons) but its more modern propulsion machinery makes it a faster ship, its average speed being about 16 knots.

Other ships in the merchant fleet include the C-types, which vary from the small coastal vessels of 5,000 dead-weight tons to the C4 freighters of more than 13,000 tons. In addition there are special types built before 1939 — primarily freighters, combination pas-

CONCRETE OIL BARGE
The Merchant Marine experimented with types. Here is an oil barge made of concrete (B7-A1).

MERCHANT MARINE HELPED TO SUPPLY TROOPS

Panoramic view of Omaha beach before the artificial harbors were set up. Merchant ships helped to pour in an unending flow of supplies.

senger and cargo ships, refrigerator ships, and bulk carriers.

The tanker fleet is made up principally of the T-type, which is the standard tanker type, and some emergency-type tankers that were converted from modified Liberty ship hulls.

Some strange conversions were effected in these ships to accommodate their wartime cargoes. One such accomplishment was the conversion of a group of vessels to transport from 300 to 600 mules each. Liberty ships were fitted out to carry prisoners of war and were subsequently refitted to return military personnel from overseas. Four Soviet vessels were converted to floating fish and crab canneries. A number of old merchant ships were sunk to form the artificial harbors for small boats in the Normandy invasion.

Personnel

At the start of the war, there were only 55,000 seamen and officers sailing the ships of the merchant fleet. Government aid was necessary to procure and train a sufficient number of merchant seamen and officers to man the expanding fleet and replace losses in personnel. The situation became critical early in 1942 when ship sailings were delayed because of insufficient manpower. An organized program was essential for mobilizing, coordinating, and administering the resources of seagoing manpower and training new men. Solution to the problem was found in the creation of three divisions under the War Shipping Administration: the Recruitment and Manning Organization (RMO), the Training Organization, and the Maritime Labor Relations Organization. The efforts of these three agencies resulted ultimately in a seagoing force of 250,000 that was kept within the framework of the civilian status of the maritime industry despite the fact that the seamen and officers carried on their work under combat conditions.

A major accomplishment of RMO was effecting the return to the Merchant Marine of nearly 100,000 men, many of them established in well-paying jobs in private industry ashore. RMO actually hired only 25 percent of all seamen; the remaining 75 percent were hired by ship operators and unions. It was RMO's responsibility to function where regular means of hiring were not swift and sure enough to meet wartime situations. This organization transported men by boat, train, plane, and even station wagon when a ship was delayed in sailing because it was below complement. Only a few hours before the Normandy invasion, a group of urgently needed merchant ship engineers was flown by Navy transport planes from the United States to England.

Selective Service delegated to RMO the authority to certify active seamen to their draft boards for occupational deferment. During the war, the turnover rate of men in the Merchant Marine was less than one-fourth of what it had been before the war.

Training

The program for training personnel for service in the Merchant Marine was established in 1938 by the United States Maritime Commission for the purpose of carrying out its responsibility for manning the merchant fleet with a trained and efficient citizen personnel. At the start of the war, with the increase in construction of new vessels for the Merchant Marine, the training program was greatly enlarged. Training stations and the training functions were transferred to the War Shipping Administration which conducted training through the Maritime Service, the Merchant Marine Cadet Corps, and the state maritime academies.

The Maritime Service. Seven training stations and eight training ships were used by the Maritime Service during the war. Officers were trained at New London, Connecticut, and at Alameda, California; radio operators were instructed at schools at Gallups Island in Boston Harbor and at Hoffman Island in New York Harbor; unlicensed personnel attended schools at Sheepshead Bay in New York, at Avalon, California, and at St. Petersburg, Florida.

In addition to these training schools, schools for the upgrading of both licensed and unlicensed personnel were located at principal ports, and several schools were maintained for the training of specialists, such as engineers, pumpmen, carpenters, and electricians. The Maritime Service Institute located in New York City conducted then, as in peacetime, correspondence and extension courses.

A wartime innovation appeared in the training of pursers to perform the duties of medical corpsmen. The revolutionary changes in the power plants of merchant ships during the war period necessitated the training of men to maintain and operate them. When new electronic devices, such as loran and radar, were added to merchant ship equipment, it was necessary to add that type of training.

Merchant Marine Cadet Corps. The Merchant Marine Cadet Corps trains young men who are American citizens and high school graduates to become officers in the Merchant Marine. This training is conducted in three institutions: two cadet schools, one at San Mateo, California, and the other at Pass Christian, Mississippi; and the U. S. Merchant Marine Academy at Kings Point, New York. The entire course covers a period of four years and includes training both ashore and afloat. After spending two years that are divided between shore training at one of the cadet schools and sea duty, the cadet-midshipmen start a two-year course at the Merchant Marine Academy, Kings Point. Upon graduation they are appointed as ensigns (inactive) in the Naval Reserve and as ensigns in the Maritime Service.

State Maritime Academies. There are five state maritime academies located in various sections of the country. These are state institutions operated with the aid of federal funds and under federal supervision. Their students are trained to become officers in the Merchant Marine. Prior to 1938, when the Division of Training of the Maritime Commission was created, the state maritime academies were the only source of trained personnel for the maritime industry.

Established in 1911, these institutions were placed under the federal supervision of the Navy Department, which was required to supply suitable training vessels and maintain them. In 1940, their supervision was transferred to the Maritime Commission. The course of study is three years in length, and cruises in foreign waters are included in the training offered.

Peacetime Organization

The Merchant Marine Act of 1936 in its Declaration of Policy states:

> It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States insofar as may be practicable, and (d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel. It is hereby declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine.

The United States Maritime Commission which came into being under the Act of 1936 was created for the purpose of carrying out the policy stated above. It is composed of five members, appointed by the President of the United States by and with the advice and consent of the Senate. The President designates the member who is to act as chairman and the Commission may elect one of its members to act as vice-chairman. The term of office normally is six years and only three members of the Commission may belong to the same political party.

Not eligible for positions are any persons who within three years prior to appointment have been employed by or have had any pecuniary interest in ships or shipping. Membership in the Commission is a full-time job.

At the time that it was created (1936) the Maritime Commission was directed to make a survey of the American Merchant Marine in order to determine the additions and replacements necessary to carry out the policy as set forth in the Act of 1936. Following are some of the things it is authorized to investigate, determine, and keep current records of:

1. The ocean services, routes, and lines from ports in the United States, its Territories, or possessions to foreign markets that are essential for promotion, development, expansion, and maintenance of foreign commerce.
2. The type, size, speed, and other requirements of the vessels which should be employed in such services or on such routes or lines, and the frequency and regularity of the sailing of such vessels. with a view to furnishing adequate, regular, and permanent service.
3. The relative cost of construction of comparable vessels in the United States and in foreign countries.
4. The extent and character of the governmental aid and subsidies granted by foreign governments to their merchant marine.
5. The number, location, and efficiency of shipyards in the United States.
6. The advisability of enactment of legislation that will authorize the Commission in an economic or commercial emergency to aid farmers and producers of coal, cotton, lumber, and cement in any section of the United States to transport and land their products in any foreign port.
7. New designs, new methods of construction, and new types of equipment for vessels; possibilities of promoting the carrying of American foreign trade in American vessels; and intercoastal and inland water transportation, including their relation to transportation by land and air.

Other duties assigned to the Maritime Commission are the training of Merchant Marine personnel. The post-war restoration of foreign commerce is also assigned to this group. Other federal departments and agencies are authorized and directed to cooperate with the Commission in carrying out their duties when necessary.

CHAPTER 27

THE UNITED STATES MARINE CORPS

INTRODUCTION

Mission of the Marine Corps

The United States Marine Corps is headed by the Commandant of the Marine Corps. Authorized strength of the Corps is 20 percent of that authorized for the Navy.

The missions of the Corps, as defined by law, are as follows: To provide Fleet Marine Forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign; to develop, in coordination with other Services, those phases of amphibious operations which pertain to the tactics, techniques, and equipment employed by landing forces; to provide detachments and organizations for service on board naval vessels; to provide security detachments for protection of naval stations and bases; and to perform such other duties as the President may direct.

In addition to the foregoing missions, which have been stated in the National Security Act of 1947, succeeding directives by the Secretary of Defense have given to the Marine Corps primary responsibility within our defense establishment for development of amphibious techniques, material, and doctrine pertaining to landing operations, thus ratifying the pioneering role established by the Corps in this field since before World War I.

Marine Corps Tradition

The United States Marine Corps, perhaps to a greater degree than any other military group, demonstrates the power of pride in tradition to unify and motivate a fighting force. Almost as soon as he becomes a member of the organization, the Marine learns that his traditions are as much a part of his equipment as his pack or his rifle. These traditions have been building up since the Continental Marines were organized in 1775 on 10 November, the date on which Marines today celebrate the Corps' "birthday." Marine Corps tradition has many phases: devotion to duty, discipline, loyalty—to country and to Corps, self-sacrifice, versatility, and dependability.

Tradition lies in the Marines' uniforms, equipment, and insignia; in the words of the "Marines' Hymn"; and in their nicknames.

The reasons assigned for some of the features of the uniform, like those associated with the naval uniform, may or may not be authentic. The official colors of the Marine Corps are scarlet and gold. The red stripe on the trousers appeared soon after the Mexican War and is said to symbolize the bloody struggle at Chapultepec, where Marine storming parties led the Army's attack. Red has always been used by British armed forces and the touches of that color that appear on the present Marine uniform may be a reminder of joint service of British and American Marines prior to the Revolutionary War.

The type of cross-hilted Mameluke sword carried by Marine officers dates back to the assault and capture of the Fortress of Derna in Tripoli by Lieutenant O'Bannon who received such a sword in surrender from the defeated Tripolitan commander. This was the first time in history that the United States colors had been raised over a fortress in the Old World.

The familiar emblem of globe and anchor, officially adopted in 1868, is symbolic of world-wide service and achievement. The spread eagle, national symbol, holds in its beak streamers that bear the Marines' motto, *Semper Fidelis*, officially adopted in 1880. This motto replaced "By Sea and Land," which was used until shortly after the Civil War.

"The Marines' Hymn" dates back to the mid-nineteenth century; and the Marine Corps march, "Semper Fidelis," was composed in 1888 by John Philip Sousa, at that time leader of the United States Marine Band, traditionally "The President's Band" for White House functions. The author of the first stanza of the "Marines' Hymn" is unknown, but the words "From the halls of Montezuma to the shores of Tripoli" commemorate, in reverse chronological order, the accomplishments of the Marine Corps in the Mexican War and in the war against the Tripolitan pirates.

The origin of the term "Leatherneck" may lie in the fact that back in 1798 Marines wore a leather stock, or collar, to protect the jugular vein from saber slashes. The nickname of "Devil-Dogs" was reputedly assigned to Marines by the Germans who were said, in their official reports of the action at Belleau Wood during World War I, to have referred to the Fourth Marine Brigade as *Teufel-hunden.*

MARINE COLOR GUARD
Rugged in combat, on parade the United States Marines are the perfect example of proper military bearing.

HISTORICAL BACKGROUND

Earliest "Marines"

Fighting men have been assigned to ships since the time of the Phoenicians, about five centuries before the Christian Era. The "marines" of those days took part in naval engagements, defended their own ships, and boarded those of the enemy. They captured the land approaches of a foreign harbor and formed raiding parties that took the offensive and enabled the fleet to attack on land.

The Greeks and Romans also followed this practice and the British continued it. In 1664, during the reign of Charles II, there was organized the Admiral's Maritime Regiment. This was later designated the Regiment of Marines, and in war it was the first to embark with the fleet for service afloat.

First American Marines

In 1740, the American Colonial Marines came into being, concurrently with the reestablishment of the Royal Marines, and they served under Admiral Vernon of the Royal Navy, chiefly in the West Indies. Shortly after the founding of the American Marines, the King commissioned Alexander Spotswood, ex-Governor of the Colony of Virginia, to act as Commandant of the organization. Lawrence Washington, half-brother of George Washington, was an officer in the American Marines at the time the organization was assigned as the 43rd Regiment of Foot in the British Army.

The Continental Marines were organized in 1775 as a regular branch of our country's armed services, and this group performed admirably during the American Revolution. On Lake Champlain they served with the lake fleets of the Continental Navy; they made several expeditions to the Bahamas with the naval forces and saw action with John Paul Jones and with Washington's Army. The first United States amphibious operation of the Revolutionary War as well as the first landing by our Marines took place on 2 March 1776 at New Providence Island in the Bahamas when 300 Marines, led by Captain Samuel Nicholas, seized the British forts defending that place. Following the Revolution they, like the Navy, were for the time being inactivated.

Marine Corps Activity, 1798-1847

The real beginning of the Marine Corps as it exists today was provided in the Act of 11 July 1798 when we were starting the naval war with France. The Marines were active in that war until 1801 and then went on to fight the Barbary pirates until 1805. They were aboard practically every American warship in the War of 1812 and saw action with the Army in the Battle of Bladensburg in 1814 and with Jackson at New Orleans. A group of pirates was their target in 1823 when Marines formed part of a landing force at Cuba; the following year their assignment was suppression of a mutiny in the Massachusetts State Prison. The year 1832 found them in action against Malay pirates at the Island of Sumatra, and four years later they helped the Army handle the Greek and Seminole Indians in Georgia and Florida. In this lengthy campaign they served under their illustrious Commandant, Colonel Archibald Henderson, whose tenure of office outlasted ten Presidents of the United States.

In the Mexican War, a battalion of Marines marched with General Scott to Mexico City, led the attack on the Castle of Chapultepec, and went on to the National Palace, the "Halls of Montezuma" mentioned in the "Marines' Hymn."

Accomplishments, 1861-1914

In the Civil War, Marines served ashore and afloat. They were in the operations that resulted in the capture of New Orleans and took part in the defense of the Atlantic Coast; they were active in engagements in the Gulf and in the Mississippi Valley. On land, they were at the Battle of Bull Run (Manassas), Island No. 10, Fort Fisher, and Port Royal Sound. Before the war started, under command of Colonel Robert E. Lee, USA, they participated in the capture of John Brown and suppressed the insurrection at Harpers Ferry.

Between the close of that war and the start of the Spanish-American War, they traveled far, quelling civil disturbances in Baltimore and Philadelphia, and protecting American lives and property in the Caribbean area, in Korea, and in China. In 1871, a battalion of Marines, advance portion of a naval force, stormed and destroyed the Korean forts as a return action for serious offenses committed against Americans. In 1882, they landed beside the British, restoring order in Alexandria, Egypt.

A fleet battalion of Marines were the first United States troops to land at Guantanamo Bay, Cuba, in the War with Spain, and Marines served under Admiral Dewey and Admiral Sampson at Manila Bay and in the naval battle off Santiago de Cuba. After the victory at Manila Bay, Marines occupied the Spanish Naval Arsenal at Cavite, and from that time on they garrisoned that station.

After the War with Spain, Marines helped to squelch the Philippine Insurrection. In the summer of 1900, during the Boxer Rebellion in China, they participated in the heroic defense of Peking's Legation Quarter and alternately helped and were helped by the Royal Welsh Fusiliers at various stages in the fighting at the walls of Tientsin and the ultimate relief of Peking. This support gave rise to mutual admiration which to this day is commemorated by an exchange of cables on 1 March, Saint David's day. The message is simply, "And Saint David," the ancient Welsh password.

The year 1903 saw Marines in Santo Domingo and Korea; a special detail served as guards for a United States diplomatic mission traveling to Abyssinia by camel caravan. From 1906 to 1908, the Marines par-

HOWITZER CREW LOADING
A Marine gun crew loading and preparing to fire a 105-mm Howitzer, a formidable piece of artillery.

ticipated in the Army of Occupation in the Cuban Pacification; from 1909 to 1912, they were busy in Panama and Nicaragua; in 1914, an expedition was sent to Vera Cruz, Mexico; and in 1915, Marines occupied Haiti, on orders from the State Department

During this period, as well, forward-looking officers of the Corps, such as John A. Lejeune and John H. Russell (both subsequently to become Commandant) had already visualized the modern Marine Corps as a fleet expeditionary force designed for the seizure and defense of advanced bases, as the means whereby a balanced fleet projects its power onto the shoreline. In line with this thinking, an Advance Base Regiment (ancestor of the Fleet Marine Force) had been organized within the Corps for just such missions, and, prior to our entry into the European War, primitive steps toward development of modern amphibious techniques were underway.

Marines in World War I

The Fourth Marine Brigade served as one of the infantry brigades of the Second American Division and fought at Belleau Wood, Soissons, St. Mihiel, Blanc Mont Ridge, and the Meuse-Argonne. The Fifth Marine Brigade served principally on military police and line of communications duty in France during World War I. Marine aviation units under Major A. A. Cunningham, the Marine Corps' first aviator, formed the Day Wing of the Northern Bombing Group in northern France and Belgium. A total of 57 bombing missions were flown by Marine pilots, and they accounted for at least a dozen German planes. An antisubmarine patrol station was operated in the Azores from January 1918 to 1919. Major Francis T. Evans, who commanded this station, has the distinction of being the first man to loop a seaplane, a feat which up to that time had been considered an impossibility.

Between World Wars

The period of peace between World War I and World War II was anything but peaceful for the United States Marines. In the Caribbean, they carried on a continuous effort to restore peace, acting as supporter of our foreign policy. Three Caribbean countries (Haiti, Santo Domingo, and Nicaragua) were affected by their campaigns against disorderly factions, for as requested and controlled by the Department of State they helped the government of those countries to quell armed revolt and organize efficient native police forces that could handle insurrections after they had withdrawn. They fought in Haiti in two campaigns from 1915 to 1934; they took action against bandits in the Dominican Republic over a period of six years; and performed the same duty in Nicaragua from 1927 to 1932.

Constantly recurring duty in China has brought Marines there on several occasions since 1854, when internal strife necessitated their presence to protect American citizens. Between that time and the Boxer Rebellion in 1900 they landed to perform a similar service on various occasions. In 1911 they were needed to protect Americans during the overthrow of the Manchu Dynasty. Troublesome conditions again in 1924 required the strong protective arm of the Marines, and in 1927 a force of about 5,000 Marines was stationed at various points, principally Shanghai and Tientsin. The situation being fairly quiet by 1929, most of the force returned to the United States, leaving only the Fourth Regiment in Shanghai.

In 1941 Marines were stationed throughout the world. About 2,000 were serving in China and the Philippines, under the Commander in Chief of the Asiatic Fleet. In addition to the Fourth Marines in Shanghai, there were detachments in Peiping and

MARINE ARTILLERY

Marines calibrate 105-mm's before battle on New Georgia. In the hands of Marines, artillery reaches a high peak of effectiveness.

Tientsin, North China, and two detachments at Olongapo and Cavite; several thousand Marines were on duty at naval stations in the Hawaiian Islands, Guam, Wake, Midway, American Samoa, the Panama Canal Zone, and Cuba. Marines were in Iceland, on various islands in the Atlantic and Caribbean area, and in England and northern Ireland.

In spite of its world-wide service on far-flung outposts and expeditions, perhaps the most important contribution of the Marine Corps to the nation during this period — or during the entire existence of the Corps, for that matter — was its evolution of the techniques and doctrine for successful amphibious warfare, which were brought into being at the Marine Corps Schools, Quantico, Virginia, primarily between 1921 and 1935. As a necessary concomitant to this doctrinal development, the Fleet Marine Force, primary instrument for execution of these doctrines, was organized in 1933. Both the Fleet Marine Force organization and the basic doctrines upon which it was shaped served virtually unchanged in concept throughout all of World War II, and in 1941, when the

Army began to show interest in landing operations (which had hitherto been exclusively within the Marine Corps province), Marines were able to provide a working doctrine and to train what ultimately became a total of seven Army divisions, including the first three such units of the Army ever to receive amphibious training.

Marines in World War II

Any story of the war against Japan in the Pacific, the greatest naval war of all time, brings into sharp focus the activities of United States Marines, for they were part and parcel of that war from the day of the treacherous attack against Pearl Harbor to the occupation of conquered Japan. Marines served at Corregidor and Bataan, where American forces finally were overpowered and captured despite a gallant defense in the face of a Japanese force greatly superior in numbers and material. Our outpost island of Guam fell to the Japanese only after a determined but futile stand by the handful of Marines stationed there. The stubborn defense of Wake, with only the scantiest hope for success in view of the overpowering strength of the attacking Japanese task force, excited the admiration of the nation in its darkest hour and won grudging respect from the enemy.

Throughout the early part of 1942, while the enemy roamed the Pacific at will, Marine defense battalions were sent to critical outlying islands in the Pacific to defend and hold them until a counteroffensive could be launched. On 7 August 1942 Major General A. A. Vandergrift landed his 1st Marine Division (reinforced) — then the only United States troops in readiness for amphibious war — on the island of Guadalcanal in the British Solomon Islands and on several small islands guarding the naval base at nearby Tulagi. The battle for Guadalcanal was no sharp, sudden clash, for the Japanese, well aware that their aggression to the south in the direction of Australia was threatened, did everything in their power to defeat the United States Fleet, to seize control of the air, and wipe out the Fleet Marine Force troops ashore.

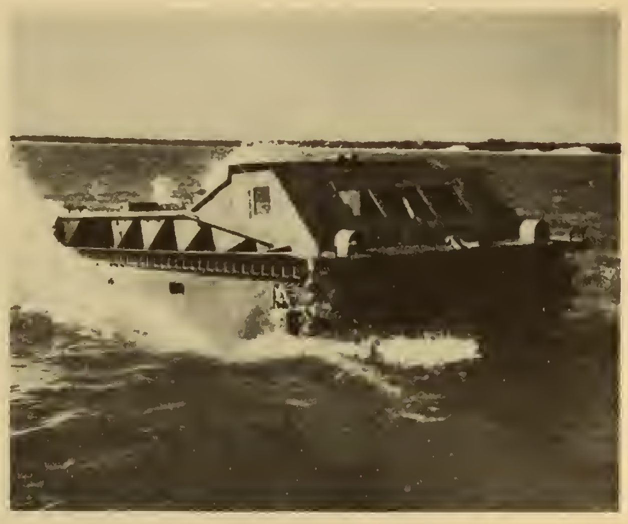
AMPHIBIOUS TRAINING

Beach at Little Creek, Virginia, where shore-party methods are taught. Again, in peacetime, the Marines are developing and perfecting amphibious techniques.

THE ATTACK
Against the fire of Jap machine guns, Marines scamper up and over a coconut log barricade. They are moving forward from their beachhead on Tarawa.

For over four months the battle raged on land as fresh Japanese troops were brought down and landed, only to be decimated by General Vandergrift's Marines. The long channel between Guadalcanal and Tulagi became an iron-bottomed sea, cluttered with United States and Japanese ships sunk in major naval engagements. From Henderson Field, the prize airstrip on Guadalcanal, Navy, Marine, and Army planes rose to shoot down Japan's best pilots.

With Guadalcanal secured, and the first great United States offensive in the Pacific an unqualified success, Marines of newly created divisions fought the Japanese from two directions. From Guadalcanal the 1st and 3d Marine Divisions moved north through the upper Solomons to New Britain and Bougainville, making the reduction of Rabaul, one of Japan's greatest island fortresses, a foregone conclusion. In the meantime the 2d Marine Division landed at Tarawa,



MARINE AMPHIBIOUS TRACTOR
The Marine Corps used this seagoing tractor to traverse bogs, creeks, dry land, and bodies of water.

first step in the Central Pacific, and proved once and for all that the doctrine and techniques of waging amphibious warfare, pioneered by the Marine Corps in the middle period between the two great wars, were sound even when applied against a strongly defended enemy-held island guarded by a reef barrier.

Then came the Marshalls, another step in the thrust through the Central Pacific, and the 4th Marine Division, part of the Marine V Amphibious Corps gained its first combat experience in an operation where tactical surprise and crushing air and naval bombardment put the fanatical Japanese at an immediate disadvantage. From the Marshalls the offensive moved on to the west, the next amphibious assault being against the Marianas. Here, in mid-1944, a task force of field army size, under an over-all Marine command, comprising two Marine amphibious corps, three Marine divisions, a Marine brigade, and two Army divisions, wrested the strategic islands of Saipan, Tinian, and Guam from a stubborn enemy and breached the Japanese inner island defense chain. In this campaign, the veteran 2d, 3d, and 4th Marine Divisions, and the newly organized 1st Provisional Marine Brigade (new in name, but filled with veteran components), showed not only their adeptness in the art of amphibious warfare, but demonstrated the fact that the Fleet Marine Force, as the landing instrument of the fleet, was a hard-hitting, dependable force, capable of seizing for the Navy the far-flung bases necessary in carrying the war home to Japan.

After the Marianas came the Palaus where the 1st Marine Division in its third major operation landed on the bitterly defended island of Peleliu and seized it, providing General MacArthur with protection on his eastern flank as he prepared to move into the Philippines.

In February 1945, the V Amphibious Corps, now including the Veteran 3d and 4th Marine Divisions, along with the new 5th, landed on the sulphurous island of Iwo Jima to fight one of the bitterest actions

ASSAULT WAVE AT OKINAWA
Armored amphibious tractors of a Marine battolion form into line for the drive to the beach.

of the war. The Japanese, having profited from earlier experiences against Marines, organized the island's excellent terrain to a degree never encountered before and died to a man in this last-ditch fight which shocked the world. The hard-won victory at Iwo paved the way for later landings on Okinawa and helped to make secure the air lanes followed by B-29's to the Empire.

After 82 days of bitter fighting, the island of Okinawa, last obstacle before the home Japanese islands, fell to American forces. The 1st and 6th Marine Divisions, oldest and youngest respectively of the six Marine divisions organized in World War II, participated as the III Amphibious Corps in the entire campaign. Here as before, the Marine divisions demonstrated their versatility, taking part not only in the amphibious assault but in the extensive land fighting that followed. And here again the Marines fought under the guns of the fleet, operating over 6,000 miles from home waters and threatened continuously by the Japanese kamikaze planes.

The war saw the Fleet Marine Force expand from two divisions operating under an amphibious corps, to six divisions, comprising two corps which were earmarked to spearhead the final landings on Japan proper. Although the Japanese were defeated before the atom bomb was dropped on Hiroshima, it was only after the surrender documents were signed aboard USS *Missouri* that Marines were to go ashore on the home islands of the enemy, this time not as assault troops, but as a part of the Allied occupation forces that moved into Japan and Japanese-controlled territory.

ORGANIZATION AND ADMINISTRATION

Headquarters, U. S. Marine Corps

The Commandant of the Marine Corps is charged with and is responsible for the procurement, discharge, education, training, discipline, and distribution of officers and enlisted personnel of the Marine Corps, including the Marine Corps Reserve, and its equipment, supply, administration, and general efficiency. Marine Corps Headquarters is a part of the Navy Department, but is not a bureau of that department.

Marine Corps Headquarters consists of the Offices of the Commandant, and two major departments — Personnel and Supply. Within the Offices of the Commandant are a number of functional divisions, such as Plans and Policies, Public Information, Recruiting, Reserve, and Aviation, as well as the Assistant Commandant, who also acts as Chief of Staff to the Commandant. The senior naval aviator on duty in the Division of Aviation has the title of Director of Aviation and performs additional duties as Assistant Commandant for Air.

Directly subordinate to the Commandant of the Corps are the several supporting establishments of the Headquarters organization, that is, the major Marine posts and stations that carry out training and logistic missions for the Corps as a whole. These include the two Recruit Depots, one at Parris Island, South Carolina, and the second at San Diego, California; the Marine Corps Schools at Quantico, Virginia; and the major continental bases: Camp Lejeune and the Marine Corps Air Station, Cherry Point, North Carolina, on the East Coast, and Camp Pendleton and Marine Corps Air Station, El Toro, California, on the West Coast.

MARINE MESSAGE CENTER
This message center of the Third Marine Division on Iwo Jima coordinated communications during combat.

COMMAND POST
Following on the heels of front-line troops of Marines, the company commander sets up his command post. Several means of keeping communications on the move are shown here.

Fleet Marine Force

The Fleet Marine Force (FMF), which includes all air and ground tactical units of the Corps, has been in existence since 1933 and is the principal *raison d'être* of the modern Marine Corps. The FMF consists of two division-size mobile expeditionary forces of the combined arms, including Marine Corps aviation, assigned respectively as integral components of the Atlantic and Pacific fleets. The Commanding Generals of these forces likewise occupy the status of type commanders within the fleets to which they are assigned.

The primary mission of the Fleet Marine Force is to conduct overseas amphibious operations for the seizure and defense of advanced bases as part of a naval campaign. The nature of its mission therefore requires that it be kept in a very high state of readiness for employment, and that all its units — which include infantry, artillery, armor, communications, engineer, and logistic troops, as well as aviation organizations to provide close air support — be completely mobile. One Marine base on each coast is set aside as the point at which the bulk of Fleet Marine Force ground units for the fleet in question is concentrated, just as one Marine Corps air station, similarly located, affords a home station on each coast for the Fleet Marine Force air units which are not carrier based.

Because of its completely self-supporting character — even to possession of its own tailor-made, streamlined, tactical air force — the Fleet Marine Force presents a working example of unification of all arms and branches, and can perform virtually any military mission ashore which may be required incident to fleet operations.

Marine Corps Reserve

Making allowance for functional differences, the Marine Corps Reserve organization parallels that of the Naval Reserve, and is in fact governed by the same basic legislation. The preponderance of the organized ground units of the Reserve is composed of infantry battalions, although an adequate number of specialist units, such as artillery, tracked vehicle, engineer, and communication organizations, are likewise operating. More than 30 squadrons are included in the Aviation Reserve of the Corps. Based on experience of the past war, the Marine Corps Reserve is looked upon largely as a means of affording peacetime training, rapid mobilization if needed, and units to transport personnel to the mobilization point. Here the Reserve-Regular distinction and separate organization cease to exist, and, just as in 1940, when the Marine Corps Reserve was fully mobilized, all hands become, for the duration, simply Marines.

Women's Reserve. The Marine Corps Women's Reserve, with an authorized strength of 1,000 officers and 18,000 enlisted men, was established on 13 February 1943. This organization accomplished its wartime purpose of releasing male Marines for combat duty by filling 87 percent of the enlisted billets at Marine Corps Headquarters, and nearly half of the post-troop assignments at major continental posts and stations. Many Women Reservists also served in Hawaii. Most of the women performed clerical duties but other typical assignments were to motor transport, aviation control towers, and instructional billets.

Post-war plans for women in the Marine Corps include Volunteer and Organized Components of the Reserve, and legislation enacted in 1948 provided for a Regular Component of women in the Marine Corps.

Officer Training

The Marine Corps Schools at Quantico, Virginia, are the principal media through which Marine officers receive the education that enables them to meet and discharge efficiently the responsibilities that implementation of the Corps' functions requires. Established in the District of Columbia in 1891 as a School of Application for second lieutenants, it was reorganized following World War I to meet the complex requirements of modern warfare. Noteworthy among the early achievements of the Schools was the contribution to the advancement of military science which resulted from organized and analytical study of amphibious warfare and from which emerged the doctrines employed by the United Nations in the conduct of amphibious operations during World War II.

During the past war, as might be expected, Marine training facilities were expanded tremendously, but soon after the close of hostilities the Marine Corps Schools, which had trained 34,000 officers in wartime, were reorganized to provide formal professional education similar to that offered in the pre-war period.

Upon entry into the Marine Corps, all second lieutenants are sent to the Basic School for eight months' indoctrination and instruction in fundamental military subjects. Emphasis is placed on individual and crew-served weapons, with study of their limitations, capabilities, characteristics, marksmanship, and technique of fire; on small-unit tactics; on basic administration and naval law; and on small-unit leadership. After graduation from the Basic School, the young officer normally is assigned to duty in a unit of a Fleet Marine Force or a detachment aboard ship, where he gains practical experience. If, after serving his tour of duty in the line, he desires to follow a specialty, he may request transfer to the particular field in which he is interested. On approval of such request, he is assigned to a specialist school for a course of formal instruction.

Specialist schools include the Communication Officers' School, the Ordnance School, and the Aerial Observers' School, all located in Quantico. For training in the specialist fields not represented in the Marine Corps Schools system, personnel are sent to appropriate Army and Navy schools. There is also an Extension Division which offers correspondence courses for Marine Corps Regulars and Reserves, enabling them to further their military education even though they may not be able to attend resident classes.

As the officer rounds out ten years of service he becomes eligible for assignment to the Junior Course of the Amphibious Warfare School. Here he undergoes nine months of intensive postgraduate instruction on the battalion and regimental level, directed toward the training of captains and majors for command and staff duties within a regimental combat team or an air group of a Fleet Marine Force, with

PRACTICE LANDING

Marines practicing landing operations at New River, North Carolina. Here they are hauling a pack howitzer from a landing barge.

particular emphasis on the coordinate employment of air, naval, and ground elements in amphibious operations.

When the officer has accumulated approximately 18 years' service, he becomes eligible for assignment to the Amphibious Warfare School Senior Course. The purpose of this school is to train officers in staff and command duties at the division and corps level. The course extends over a period of nine months and includes a generous leavening of practical field work.

Through this training system the Marine Corps officer is afforded a progressive, professional military education that extends over 20 years. In addition to those schools maintained by the Corps itself, the officer attends such outside schools as the Armed Forces Staff College and the National War College, which are sources of higher military education.

CHAPTER 28

NAVAL TERMS AND CUSTOMS---THEIR ORIGIN AND MEANING

INTRODUCTION

Pronunciation

A newcomer to the Navy will probably be surprised when he hears the word *tackle* pronounced "taykle," or *forecastle,* "focsul," or *gunwale,* "gunnel." As a matter of fact, every profession has a language of its own, which to the uninitiated, may seem strange. The Navy is no exception, and its vocabulary is plentifully flavored with salty expressions and uncommon terms.

Naval Expressions

Likewise, curiosity will no doubt be aroused as to the origin and meaning of certain strange naval customs, traditions and expressions. "Piping the side," "scuttlebutt," and "show a leg" are typical examples. Many of these nautical customs and terms have carried over from the distant past in spite of the fact that the navies of the world have been completely revolutionized during the last hundred years. It is doubly important, therefore, if we are to use naval expressions intelligently, and understand seagoing customs, that we delve into history in order to discover a little about their origin and meaning.

ORIGIN, DEFINITION, AND USAGE

Anchor Watch

The origin of the term "anchor watch" is interesting. Years ago when ships were equipped with anchor cables of hempen rope and riding lights of oil, special care was taken, while riding at anchor, to see that these lamps were not extinguished, that the cables did not part, and that the ship did not drag her anchor. The watch which was responsible for this particular duty was designated the anchor watch. The anchor watch, as a sea term, is still retained, although its duties have been changed greatly in the march of progress. Today, a detail on deck at night safeguards the vessel when at anchor, and it is called the anchor watch.

Avast

"Avast" is a corruption of the original form which meant "hold fast" or "stand fast." Today it is an order to stop or cease, as "Avast heaving!"

Aye, aye

The present meaning of the expression "Aye, aye," which originally was "Yes, yes" (old English), is, "I understand, sir, and I will do it."

Beach Comber

Formerly, a loafer or vagrant along the seacoast who searched the beaches for material washed up from wrecked ships, was called a beach comber. Today the term generally refers to a tramp of the sea, an unreliable drifter, or a derelict seaman found unemployed on the waterfront.

Bells

Certain words and expressions preserve for us old customs, as in the instance of bells struck aboard ship. They are not primarily intended to replace clocks for telling time. But they do tell clock time by measuring the periods when certain members of the crew are standing watch.

It all started with the hourglass — which really wasn't an hourglass but a half-hour glass. The quartermaster on watch turned the glass at the end of his first half-hour, ringing an additional stroke each time, until at the end of four hours he rang eight strokes, signaling the completion of his watch and the beginning of the next four-hour watch. So it went during the six watches of the twenty-four hours, ending at midnight. It should be noted, however, that the length of the watch sometimes varies. For example, there are normally two "dog" watches of two hours each between 1600 and 2000. While the hourglass has long since been out of date, the bells are still used on shipboard.

Bilge

"Bilge" usually refers to the bottom of a ship, or more correctly the curved part of the ship's hull. It also has another connotation. Midshipmen who are dropped from school for academic reasons are said to be bilged. Thus when used as a verb, the term means to be dropped out of the bottom — in this case the bottom of the class.

Binnacle List

The binnacle list is the sick list. It gets its name from the old nautical practice of placing the sick list on the binnacle each morning so it would be readily available for the captain.

Bitter End

"Bitter end" was the turn of the cable's end around the bitts. It is now used to define the end of the chain cable which is secured in the chain locker.

Boatswain

"Boatswain" is pronounced "bo'sn." "Swain" or "swein" is the Saxon word for servant or boy. In this instance the word boat refers to the entire ship. Coxswain, pronounced cox'un, has a similar derivation. "Cock" is an old term referring to a type of small boat. Coxswain is now the name applied to the man in charge of a small boat.

Boatswain's pipe. The boatswain's pipe, or whistle, is an article of nautical equipment of great antiquity. Originally employed to "call the stroke" in ancient row-galleys, it became, in the early English Navy, a badge of office and of honor. Later, the pipe became the distinctive emblem of the boatswain and his mates. Today the boatswain's mate uses his pipe when the "word is passed," when officers are piped over the side, etc.

BOATSWAIN'S PIPE
The boatswain's pipe was in use long before loudspeaker systems were invented. It is being used here to pipe the crew to attention just before general quarters is sounded.

Bumboat

The bumboat is a boat employed by civilians to carry salable provisions, vegetables, and small merchandise to ships. The term may have been derived from "boom-boat," indicating boats permitted to lie at booms.

Captain

This term comes from the Latin *caput* meaning "head." Until 1862, a captain was the highest commissioned officer in the United States Navy.

Caulk

"Caulk" is commonly pronounced "cork." The word caulk means to pack a seam in the planking of a ship. When wooden ships were caulked in the dry dock, the workmen usually had to lie on their backs underneath the hull. In this position it was not difficult to fall asleep. To "take a caulk," or to "caulk off," is the sailor's expression for sleeping, or taking a nap.

Chains

Originally chains were used to brace the platform on which the leadsman stood when heaving the lead. Gradually the term "chains" was used to designate the platform itself. Today, any place where a man stands when heaving the lead, platform or otherwise, is called the chains.

Charlie Noble

The term "Charlie Noble" is applied to the galley smoke-pipe. While its origin is obscure, it is generally believed to have been derived from the British merchant skipper, Charlie Noble, who demanded a high

BUMBOAT
Native boats are sometimes used for transportation. Here American officers board a bumboat for a trip to a Liberty ship in the harbor at Calcutta.

LEADSMEN IN CHAINS
Chains were formerly used to brace the platform on which the leadsmen stood. Today any place where the leadsman stands when heaving the lead is called the chains.

polish on the galley funnel. His bright copper galley funnel became well known in the ports he visited.

Christening a Ship

Launching ceremonies have had a religious significance from the earliest days. The christening ceremony originated as a propitiation to the gods of the elements. In some countries as recently as a hundred years ago a launching frequently resembled a baptismal ceremony and was performed by priests.

Early in the 19th century, women and those other than the clergy and high officials began to take part in the ceremony of launching ships.

The civil ceremony usually consists in the naming of the vessel by a sponsor, and at the same time breaking a bottle of wine against the side of the ship as she slides into the water. Women have been known to miss the ship entirely, and so today the bottle is secured by a lanyard to the bow of the ship — as a safety measure for spectators.

Commission Pennant

The origin of the commission pennant is said to date back to the 17th century when the Dutch were fighting the English. The Dutch admiral hoisted a broom at his masthead, to indicate his intention to sweep the English from the sea. The gesture was soon answered by the English admiral who hoisted a horsewhip, to indicate his intention to chastise the insolent Dutch. The British carried out their boast and ever since, the narrow, or coachwhip pennant (symbolizing the original horsewhip) has been the distinctive mark of a vessel of war and has been adopted by all nations.

The commission pennant, as it is called today, is permanently attached to a small wooden staff. It is blue at the hoist with a union of seven white stars, and red and white at the fly in two horizontal stripes. (The number of stars has no special significance but was arbitrarily selected as providing the most suitable display.) It is flown at the main by vessels not carrying flag officers. In lieu of the commission pennant, flagships fly the commodore's or admiral's personal flag — blue with white stars — according to rank.

Crossing the Line

The boisterous ceremonies of crossing the line (the equator) are of vintage so ancient that their derivation is lost. It is said that this custom had its origin in propitiatory offerings to the deities of the sea by mariners who thought that gods and goddesses controlled the elements.

Today when naval vessels cross the equator, those members of the crew, officers and men (called "pollywogs"), who have never before crossed the line, are initiated by the more experienced members of the crew (called "shellbacks"). The usual formula is for the "shellbacks" to attire themselves in strange costumes representing Neptune, Amphitrite, and other creatures of the sea. A court is held among Neptune's subjects and the novices are summoned to trial. The fate administered to each is in the nature of ridicule, such as a parade of the person's particular idiosyncrasies and a caricature of his foibles. The victim is usually lathered with some frightful concoction, shaved (with a wooden razor) and ducked backward into a tank of water. He is then issued a certificate, signed by Neptunus Rex, documenting the fact that he has crossed the line and is now a full-fledged "shellback."

Cut of His Jib

The nationality of the early sailing ships was frequently determined by the shape or cut of their jib sails. Use of the phrase as applied to a man originally referred to his nose — which, like a jib, is the first feature of its wearer to come into view. Ultimately it was extended to describe a man's appearance generally.

Dipping the National Ensign

Dipping the flag is a relic of an old-time custom by which a merchant vessel was required not only to heave to when approaching a warship on the high seas, but also to clew up all her canvas. This was to indicate her honesty and willingness to be searched. Delays resulted and in later years the rule of dipping the flag was authorized as a time-saving substitute. Ships of the United States Navy return dip for dip. However, no ship of our Navy may dip her ensign except in acknowledgment of such a compliment.

Dog Watch

The term "dog watch" is a corruption of "dock watch," that is, a watch which has been docked or shortened.

Dutch Courage

"Dutch courage" is a term of nautical origin and is traced to the days when the Dutch were fighting the English. It was said that the Dutch sailors were given generous libations of the well-known "square-faced gin" before battles. The effect of this practice was called "Dutch courage" by the English.

Eyes of the Ship

Ships in the early days generally had in the bow carved heads of mythological monsters or patrons. The fore part of the ship was called the "head." The term "eyes of the ship" followed from the eyes of the figures placed there.

Flag at Half-mast

At times of mourning in old sailing days the yards were "cockbilled" and the rigging was slacked off to indicate that the grief was so great that it was impossible to keep things shipshape. Today the half-masting of the colors is in reality a survival of the days when a slovenly appearance characterized mourning on shipboard.

Forecastle

"Forecastle" is pronounced "focsul." In the days of Columbus, ships were fitted with castlelike eminences at both ends; one the forecastle, the other the aftercastle. While both structures have disappeared, the term "forecastle," referring to the same general part of the ship as the original "forward castle," still remains. Its pronunciation has changed.

Grog

Admiral Edward Vernon of the Royal Navy is responsible for the term "grog." He was in the habit of

GROG TUB

This is the grog tub aboard the USS *Constitution*, a reminder of the days when a mixture of rum and water was served as a ration to the crew.

walking the deck of his flagship in a boatcloak of grogram cloth. This suggested a nickname for the popular flag officer and Admiral Vernon came to be known affectionately as "Old Grog." In 1740, he introduced West Indian rum aboard ship and had a mixture of rum and water served as a ration to the crews. It was intended as a preventive against fevers, which so often decimated expeditions to the West Indies. This innovation was received with enthusiasm by the men on the flagship *Burford* who promptly named the beverage after this illustrious leader.

Forty years later verses were composed on the cruiser *Berwick* which bespeak the popularity of the officer and the drink, a quarter of a century after he had died.

The last two stanzas are:

A mighty bowl on deck he drew,
And filled it to the brink;
Such drank the *Burford's* gallant crew,
And such the gods shall drink.

The sacred robe which Vernon wore
Was drenched within the same;
And hence his virtues guard our shore,
And *Grog* derives its name.

Head

The ship's washroom is called the head because these facilities in the old days were located in the forward part of the ship.

Holystone

The holystone, as we see it today, is a piece of smooth brick or stone in the side of which a small hole has been gouged. A squilgee (pronounced "squeegee") handle is inserted in this socket, and kept there by the pressure exerted on it while scrubbing the deck. Sand and water are used with the holystone to scour the wooden deck.

In the early days, the handle was not in use and the seamen knelt on the deck to give it the necessary scouring. The attitude of prayer thus assumed was responsible, many think, for the stone being called "holy." There are those who think that the name comes about as the result of the fact that fragments of broken monuments from Saint Nicholas' church in England were used in the early days to scrub the ships' decks of the British Navy.

Jacob's Ladder

This ladder made of rope is used over the side and aloft. It originally led to the skysail. It is said that the allusion was to Jacob's dream in which he climbed up to the sky.

Keelhauling

The term "keelhauling" connotes a verbal reprimand; originally it comprised a cruel form of punishment. It consisted in binding the offender hand and foot, attaching weights — causing the body to sink, then drawing it under the ship's bottom from one fore yardarm to the other by means of whips. If the bottom was covered with sharp barnacles the torture was extreme and the punishment often proved fatal. It is said that the indignant protest of the international press late in the 19th century banished this practice from the sea.

Lashing Broom to Masthead

A popular custom in the United States Navy is that of lashing a broom to the masthead of a ship when she has participated in a complete victory over an enemy force (a ship making the highest gunnery or engineering record in the fleet also displays a broom) thus indicating her ability to sweep the seas. A Dutch admiral originated this custom when he sailed against the English fleet in the seventeenth century. Lashed to the foremast of his flagship was a broom with which he boasted he would sweep the English from the sea. (See "Commission pennant.")

Martinet

The term "martinet" is applied to a stickler for discipline, a "sundowner." It is associated with a French Army officer, the Marquise de Martinet.

Mast

The term "captain's mast" or merely "mast" is derived from the fact that in early sailing days the usual setting for this type of naval justice was on the weather deck near the ship's mainmast.

Midshipmen

In the early days the crew was quartered in the forecastle while the officers lived in the aftercastle.

The title of midshipmen was originally given to youngsters of the British Navy who acted as messengers and carried orders from the officers aft to the men forward. These lads who had direct contact with the officers were continuously passing back and forth *amidships*, and were gradually looked upon as officer material. They were considered apprentices and often commenced their service at the tender age of eight. The ancient term has survived and today officer candidates at Annapolis (and other midshipmen's schools) are called midshipmen.

Piping the Side

To the new officer, the custom of piping the side, an heritage from the British Navy, seems one of the strangest of all naval customs. It originated in the days of sail, when captains visited one another at sea, and were hoisted on board in a net or basket, when the weather was too rough to permit the use of gangways.

The officer of the deck ordinarily summoned from the crew several hands to assist the visitor in making the landing on deck. If he was young, a lieutenant perhaps, two boys were required to help him; if older, a commander perchance, having increased his girth as well as his rank through the years, he might require four. If, however, he happened to be a captain or an admiral, there is no doubt that he may have required six or eight to enable him properly to secure a stable footing on deck. Thus there came about the custom of having "side boys" to meet returning officers. When the custom became a regulation courtesy, the side was attended equally upon the departure.

The custom of piping the officer alongside and over the gangway is a relic of the piping which was necessary in setting taut and hoisting away the cargo net or basket containing the incoming officer.

Quarterdeck

There is evidence that the marked respect paid the quarterdeck aboard ship today had its origin many hundreds of years ago. In the days of Greek and Roman sea power, obeisances were made to the pagan altar which was placed aft. Later the same respect was paid the shrines of the Virgin similarly located. Still later the "king's colors" which were a symbol of the church and state combined became the object of respect. One is impressed with the thought that the quarterdeck has always been the honored part of the ship. It has retained its "sanctity" today. (The name "poop deck" is derived from the Latin word *puppis*, a name given the sacred deck where the *pupi* or doll images of the deities were placed.)

Salute with Guns

Theoretically all salutes were originally the act of the one who first saluted, rendering himself or his ship powerless for the time during which the honors were rendered. For example, in the days of Columbus, after firing a salute, an appreciable time — approximately half an hour — was required before the guns could be fired again. Thus, the ship first rendering the honors feared no attack and the gesture was one of friendship and confidence. Firing blank cartridges is a comparatively modern invention, occasioned, it is said, by the fact that a complimentary cannon ball once proved fatal to the honored personage. (The "present arms" salute of today was originally a gesture to present the arms for taking.)

Salute (twenty-one guns). The origin of the twenty-one-gun international salute is of interest. Originally warships fired salutes of seven guns, the number seven having probably been selected because of the mystical and symbolical significance given it in the Bible as well as among the principal nations of antiquity.

Although by regulations the salute at sea was seven guns, shore batteries were allowed to fire three guns to the ship's one. The difference was due to the fact that in those days the storage of the powder aboard ship was a matter of serious concern, because of lack of facilities for maintaining low and even temperatures in the magazines. Since powder easily spoiled at sea, but could be better kept on land, three times as many guns were, therefore, prescribed. Again, the figure three was probably selected as a multiple because of its mystical and symbolical significance.

When powder which was not so difficult to preserve at sea came into general use, the number of guns for the naval international salute was raised to twenty-one. By common agreement, the international salutes of all nations are now twenty-one guns.

International salutes grew out of custom and usage. The custom began with the strong nations exacting from foreign vessels acts of submission, sometimes

SALUTE OVER A GRAVE
Firing a gun salute has been a mark of honor for centuries among military men.

even by force, but in the 17th century the question of such ceremonials became a matter of negotiation. Although saluting was originally forced upon the vessels of smaller nations to compel them to recognize the superiority of the greater, in the final recognition of the principle of equality between nations it became customary to render salutes "gun for gun."

Salute over a grave. It is said that originally the three volleys fired into the air were, in accordance with a superstitious custom, supposed to drive away the evil spirits as they escaped from the hearts of the dead. It was thought that the doors of men's hearts stood ajar at such times permitting the devils to enter. The numbers 3, 5, and 7, have had a mystic and symbolic significance from ancient times.

Scuttlebutt

A butt is a cask or hogshead. To "scuttle" means to make a hole in a ship's side which causes it to sink. A "scuttlebutt" in the old days was a cask which had an opening in its side fitted with a spigot. Well-made casks of oak were utilized to contain fresh water for drinking purposes. This old naval term has survived to this day and now any drinking fountain in the Navy is called a scuttlebutt.

Scuttlebutt rumor. Men naturally congregate at drinking fountains — and rumors start. (A *galley yarn* is a similar term. In the early days the galley was frequently a place of meeting, and cooks had the reputation for knowing and passing on the "news.")

Show a Leg

The term "show a leg" is synonymous with "rise and shine." It is a slang expression used generally by boatswains' mates and masters-at-arms when turning the crew out of their hammocks or bunks.

The call "Show a leg" is probably derived from the days (in the British Navy) when women were carried at sea, "the wives of seamen." The women who put out a stockinged leg for identification were not required to turn out at first call.

The term "show a leg" is frequently used today to mean "make haste."

Sick Bay

Nelson, who was responsible for many of the British naval customs, as well as our own, originated the term "sick berth" in his order to the Mediterranean fleet in 1798. In line-of-battle ships, the sick berth was placed in the bows. When the round bows were introduced in 1811, the sick berth, keeping its same position, found itself in a bay (semicircular indentation). Thus in 1813 began the use of the term sick bay. (It is customary today for officers to remove their caps when entering sick bay. It may be that this custom stems from the early sailing days, when men were not admitted to sick bay until they were about ready for "slipping the cable.")

SCUTTLEBUTT
The drinking fountain in the USS *Missouri* is a far cry from the oak tubs of the old days but it's still called the scuttlebutt.

Smoking Lamp

In the old days matches were prohibited to members of the crew, and for their convenience oil lamps were swung in several parts of the ship where they could light a pipe or cigar. (Cigarettes became popular since the Civil War.)

During the routine of the day, at certain periods of drill or work, smoking was prohibited. It was a simple matter to regulate this practice. The officer of the deck needed only to order the smoking lamps extinguished.

The expression is retained to this day. Before drills, fueling, receiving ammunition, etc., the officer of the deck orders the word passed, "The smoking lamp is out," which means "Knock off smoking."

Starboard and Port

In the old Viking ships, the right side of the vessel (looking forward) was called the "steerboard" side because ships were steered by means of a heavy board which was invariably secured to the right side of the ship. Loading was avoided from that side because of the possibility of damaging the steering gear. Gradually the term "steer board" was corrupted to "starboard."

The left side of these old ships (the place of loading) was called the "load board" side and this finally became "larboard." Because of the fact that "starboard" and "larboard" sounded so much alike and this resulted in misunderstanding and accidents, the term "port" was substituted in the United States Navy for the word "larboard." A General Order (18 Feb. 1846) reads: "It having been repeatedly represented to the Department that confusion arises from the use of the words 'Larboard' and 'Starboard' in consequence of their similarity of sound, the word 'Port' is hereafter to be substituted for Larboard." (Perhaps the term "port" was used because, as ships became larger and rose higher in the water, loading took place through openings in the sides called ports.)

Sundowner

A sundowner is a harsh disciplinarian, a martinet. The term was derived from the strict captains in the early days who ordered all officers and men to be aboard by sunset.

Tattoo

The term "tattoo" is derived from the old Dutch "taptoe," meaning the time to close the taps or taverns. At a certain hour the drummers marched from post to post in the town beating their drums; "first post" was the signal given when they had taken their places and were ready to commence their rounds (this survives in the Navy as "first call"), while "last post" was sounded when they had reached the end of their rounds (this survives as our present "tattoo"). The "first call" is sounded ten minutes before "taps"; "tattoo," five minutes before "taps."

Wardroom

It is generally believed that this term also came from the British Navy. Back in the 18th century there was a compartment aboard ships near the officers' staterooms which was used as a storage room, particularly for officers' clothing. It was called the "wardrobe" and later corrupted into "wardroom." When this compartment was empty, and particularly on outbound cruises, the lieutenants met there informally and for meals. Gradually it was used entirely as an officers' mess room and such was the custom when the United States Navy came into being.

Working Off a Dead Horse

"Working off a dead horse" refers to the old custom of rigging up a stuffed horse and burning it over the side with great glee to celebrate the fact that the pay advanced at shipping on had been worked off. After this ceremony the crew started to accumulate wages "on the books." This has become a common expression ashore and a lot of "dead horses" were worked off during the depression years of the 1930's.

APPENDIX

Articles for the Government of the United States Navy

Decorations, Medals, and Ribbons

Officer's Official Records

Officer's Fitness Report

Officer Designators, Qualification, and Selection

Enlisted Service Record

Classification of Enlisted Personnel

Advancement in Rating

Navy Ratings

Discharges Issued Enlisted Personnel

Ship Designations and Names

Morse Code and Semaphore

Care of Uniforms

ARTICLES FOR THE GOVERNMENT OF THE UNITED STATES NAVY *

The Navy of the United States shall be governed by the following articles:

Article 1

The commanders of all fleets, squadrons, naval stations, and vessels belonging to the Navy are required to show in themselves a good example of virtue, honor, patriotism, and subordination; to be vigilant in inspecting the conduct of all persons who are placed under their command; to guard against and suppress all dissolute and immoral practices; and to correct, according to the laws and regulations of the Navy, all persons who are guilty of them; and any such commander who offends against this article shall be punished as a court-martial may direct.

Article 2

The commanders of vessels and naval stations to which chaplains are attached shall cause divine service to be performed on Sunday whenever the weather and other circumstances allow it to be done; and it is earnestly recommended to all officers, seamen, and others in the naval service diligently to attend at every performance of the worship of Almighty God.

Article 3

Any irreverent or unbecoming behavior during divine service shall be punished as a general or summary court-martial may direct.

Article 4

The punishment of death, or such other punishment as a court-martial may adjudge, may be inflicted on any person in the naval service—

1. Who makes, or attempts to make, or unites with any mutiny or mutinous assembly, or, being witness to or present at any mutiny, does not do his utmost to suppress it; or, knowing of any mutinous assembly or of any intended mutiny, does not immediately communicate his knowledge to his superior or commanding officer;

2. Or disobeys the lawful orders of his superior officers;

3. Or strikes or assaults, or attempts or threatens to strike or assault, his superior officer while in the execution of the duties of his office;

4. Or gives any intelligence to, or holds or entertains any intercourse with, an enemy or rebel, without leave from the President, the Secretary of the Navy, the commander in chief of the fleet, the commander of the squadron, or, in case of a vessel acting singly, from his commanding officer;

5. Or receives any message or letter from an enemy or rebel, or, being aware of the unlawful reception of such message or letter, fails to take the earliest opportunity to inform his superior or commanding officer thereof;

6. Or, in time of war, deserts or entices others to desert;

7. Or, in time of war, deserts or betrays his trust, or entices or aids others to desert or betray their trust;

8. Or sleeps upon his watch;

9. Or leaves his station before being regularly relieved;

10. Or intentionally or willfully suffers any vessel of the Navy to be stranded, or run upon rocks or shoals, or improperly hazarded; or maliciously or willfully injures any vessel of the Navy, or any part of her tackle, armament, or equipment, whereby the safety of the vessel is hazarded or the lives of the crew exposed to danger;

11. Or unlawfully sets on fire, or otherwise unlawfully destroys, any public property not at the time in possession of an enemy, pirate, or rebel;

12. Or strikes or attempts to strike the flag to an enemy or rebel, without proper authority, or, when engaged in battle, treacherously yields or pusillanimously cries for quarter;

13. Or, in time of battle, displays cowardice, negligence, or disaffection, or withdraws from or keeps out of danger to which he should expose himself;

14. Or, in time of battle, deserts his duty or station, or entices others to do so;

15. Or does not properly observe the orders of his commanding officer, and use his utmost exertions to carry them into execution, when ordered to prepare for or join in, or when actually engaged in, battle, or while in sight of an enemy;

16. Or, being in command of a fleet, squadron, or vessel acting singly, neglects, when an engagement is probable, or when an armed vessel of an enemy or rebel is in sight, to prepare and clear his ship or ships for action;

17. Or does not, upon signal for battle, use his utmost exertions to join in battle;

18. Or fails to encourage in his own person, his inferior officers and men to fight courageously;

19. Or does not do his utmost to overtake and capture or destroy any vessel which it his duty to encounter;

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* It should be noted that the Articles are presently (December 1948) in the process of revision.

20. Or does not afford all practicable relief and assistance to vessels belonging to the United States or their allies when engaged in battle.

Article 5

All persons who, in time of war or rebellion against the supreme authority of the United States, come or are found in the capacity of spies, or who bring or deliver any seducing letter or message from an enemy or rebel, or endeavor to corrupt any person in the Navy to betray his trust, shall suffer death, or such other punishment as a court-martial may adjudge.

Article 6

If any person subject to the Articles for the Government of the Navy commits the crime of murder without the territorial jurisdiction of any particular State or the District of Columbia, he may be tried by court-martial and punished with death.

Article 7

A naval court-martial may adjudge the punishment of imprisonment for life, or for a stated term, at hard labor, in any case where it is authorized to adjudge the punishment of death; and such sentences of imprisonment and hard labor may be carried into execution in any prison or penitentiary under the control of the United States, or which the United States may be allowed by the legislature of any State to use; and persons so imprisoned in the prison or penitentiary of any State or Territory shall be subject in all respects to the same discipline and treatment as convicts sentenced by the courts of the State or Territory in which the same may be situated.

Article 8

Such punishment as a court-martial may adjudge may be inflicted on any person in the Navy—

1. Who is guilty of profane swearing, falsehood, drunkenness, gambling, fraud, theft, or any other scandalous conduct tending to the destruction of good morals;
2. Or is guilty of cruelty toward or oppression or maltreatment of any person subject to his orders;
3. Or quarrels with, strikes, or assaults, or uses provoking or reproachful words, gestures, or menaces toward any person in the Navy;
4. Or endeavors to foment quarrels between other persons in the Navy;
5. Or sends or accepts a challenge to fight a duel or acts as a second in a duel;
6. Or treats his superior officer with contempt, or is disrespectful to him in language or deportment, while in the execution of his office;
7. Or joins in or abets any combination to weaken the lawful authority of or lessen the respect due to his commanding officer;
8. Or utters any seditious or mutinous words;
9. Or is negligent or careless in obeying orders or culpably inefficient in the performance of duty;
10. Or does not use his best exertions to prevent the unlawful destruction of public property by others;
11. Or, through inattention or negligence, suffers any vessel of the Navy to be stranded, or run upon a rock or shoal, or hazarded;
12. Or, when attached to any vessel appointed as convoy to any merchant or other vessels, fails diligently to perform his duty, or demands or exacts any compensation for his services, or maltreats the officers or crews of such merchant or other vessels;
13. Or takes, receives, or permits to be received, on board the vessel to which he is attached any goods or merchandise for freight, sale, or traffic, except gold, silver, or jewels for freight or safe-keeping; or demands or receives any compensation for the receipt or transportation of any other article than gold, silver, or jewels without authority from the President or Secretary of the Navy;
14. Or knowingly makes or signs, or aids, abets, directs, or procures the making or signing of, any false muster;
15. Or wastes any ammunition, provisions, or other public property, or, having power to prevent it, knowingly permits such waste;
16. Or, when on shore, plunders, abuses, or maltreats any inhabitant or injures his property in any way;
17. Or refuses or fails to use his utmost exertions to detect, apprehend, and bring to punishment all offenders, or to aid all persons appointed for that purpose;
18. Or, when rated or acting as master-at-arms, refuses to receive such prisoners as may be committed to his charge, or, having received them, suffers them to escape, or dismisses them without orders from the proper authority;
19. Or is absent from his station or duty without leave or after his leave has expired;
20. Or violates or refuses obedience to any lawful general order or regulation issued by the Secretary of the Navy;
21. Or, in time of peace, deserts or attempts to desert, or aids and entices others to desert;
22. Or receives or entertains any deserter from any other vessel of the Navy, knowing him to be such, and does not, with all convenient speed, give notice of such deserter to the commander of the vessel to which he belongs, or to the commander in chief, or to the commander of the squadron.

Article 9

Any officer who absents himself from his command without leave may, by the sentence of a court-martial, be reduced to the rating of seaman, second class.

Article 10

Any commissioned officer of the Navy or Marine Corps who, having tendered his resignation, quits his post or proper duties without leave and with intent to remain permanently absent therefrom, prior to due notice of the acceptance of such resignation, shall be deemed and punished as a deserter.

Article 11

No person in the naval service shall procure stores or other articles or supplies for, and dispose thereof to, the officers or enlisted men on vessels of the Navy or at navy yards or naval stations for his own account or benefit.

Article 12

No person connected with the Navy shall, under any pretense, import in a public vessel any article which is liable to the payment of duty.

Article 13

Distilled spirits shall be admitted on board of vessels of war only upon the order and under the control of the medical officers of such vessels and to be used only for medical purposes.

Article 14

Fine and imprisonment, or such other punishment as a court-martial may adjudge, shall be inflicted upon any person in the naval service of the United States—

1. Who presents or causes to be presented to any person in the civil, military, or naval service thereof, for approval or payment, any claim against the United States or any officer thereof knowing such claim to be false or fraudulent; or

2. Who enters into any agreement or conspiracy to defraud the United States by obtaining, or aiding others to obtain, the allowance or payment of any false or fraudulent claim; or

3. Who, for the purpose of obtaining or aiding others to obtain, the approval, allowance, or payment of any claim against the United States or against any officer thereof, makes or uses, or procures or advises the making or use of, any writing, or other paper, knowing the same to contain any false or fraudulent statement; or

4. Who, for the purpose of obtaining, or aiding others to obtain, the approval, allowance, or payment of any claim against the United States or any officer thereof, makes, or procures, or advises the making of, any oath to any fact or to any writing or other paper knowing such oath to be false; or

5. Who, for the purpose of obtaining, or aiding others to obtain, the approval, allowance, or payment of any claim against the United States or any officer thereof, forges or counterfeits, or procures or advises the forging or counterfeiting of, any signature upon any writing or other paper, or uses, or procures or advises the use of, any such signature, knowing the same to be forged or counterfeited; or

6. Who, having charge, possession, custody, or control of any money or other property of the United States, furnished or intended for the naval service thereof, knowingly delivers, or causes to be delivered, to any person having authority to receive the same, any amount thereof less than that for which he receives a certificate or receipt; or

7. Who, being authorized to make or deliver any paper certifying the receipt of any money or other property of the United States, furnished or intended for the naval service thereof, makes, or delivers to any person, such writing, without having full knowledge of the truth of the statements therein contained, and with intent to defraud the United States; or

8. Who steals, embezzles, knowingly and willfully misappropriates, applies to his own use or benefit, or wrongfully and knowingly sells or disposes of any ordnance, arms, equipments, ammunition, clothing, subsistence stores, money, or other property of the United States, furnished or intended for the military or naval service thereof; or

9. Who knowingly purchases, or receives in pledge for any obligation or indebtedness, from any other person who is a part of or employed in said service, any ordnance, arms, equipments, ammunition, clothing, subsistence stores, or other property of the United States, such other person not having lawful right to sell or pledge the same; or

10. Who executes, attempts, or countenances any other fraud against the United States.

And if any person, being guilty of any of the offenses described in this article while in the naval service, receives his discharge or is dismissed from the service he shall continue to be liable to be arrested and held for trial and sentence by court-martial in the same manner and to the same extent as if he had not received such discharge nor been dismissed.

Article 15

The proceeds of vessels or any property hereafter captured, condemned as prize, shall not be distributed among the captors, in whole or in part, nor shall any bounty be paid for the sinking or destruction of vessels of the enemy hereafter occurring in time of war.

Article 16

No person in the Navy shall take out of a prize, or vessel seized as a prize, any money, plate, goods, or any part of her equipment unless it be for the better preservation thereof or unless such articles are absolutely needed for the use of any of the vessels or armed forces of the United States before the same are adjudged lawful prize by a competent court; but the whole, without fraud, concealment, or embezzlement, shall be brought in in order that judgment may be passed thereon; and every person who offends against this article shall be punished as a court-martial may direct.

Article 17

If any person in the Navy strips off the clothes of or pillages or in any manner maltreats any person taken on board a prize, he shall suffer such punishment as a court-martial may adjudge.

Article 18

If any officer or person in the naval service employs any of the forces under his command for the purpose of returning any fugitive from service or labor, he shall be dismissed from the service.

Article 19

Any officer who knowingly enlists into the naval service any person who has deserted in time of war from the naval or military service of the United States or any insane or intoxicated person or any minor between the ages of 14 and 18 years without the consent of his parents or guardian or any minor under the age of 14 years shall be punished as a court-martial may direct.

Article 20

Every commanding officer of a vessel in the Navy shall obey the following rules:

1. Whenever a man enters on board the commanding officer shall cause an accurate entry to be made in the ship's books, showing his name, the date, place, and term of his enlistment, the place or vessel from which he was received on board, his rating, his descriptive list, his age, place of birth, and citizenship, with such remarks as may be necessary.

2. He shall, before sailing, transmit to the Secretary of the Navy a complete list of the rated men under his command, showing the particulars set forth in rule one, and a list of officers and passengers, showing the date of their entering. And he shall cause similar lists, to be made out on the first day of every third month and transmitted to the Secretary of the Navy as opportunities occur, accounting therein for any casualty which may have happened since the last list.

3. He shall cause to be accurately minuted on the ship's books the names of any persons dying or deserting and the times at which such death or desertion occurs.

4. In case of death of any officer, man, or passenger on said vessel he shall take care that the paymaster secures all the property of the deceased for the benefit of his legal representatives.

5. He shall not receive on board any man transferred from any other vessel or station to him unless such man is furnished with an account, signed by the captain and paymaster of the vessel or station from which he came, specifying the date of his entry on said vessel or at said station, the period and term of his service, the sums paid him, the balance due him, the quality in which he was rated, and his descriptive list.

6. He shall, whenever officers or men are sent from his ship for whatever cause, take care that each man is furnished with a complete statement of his account, specifying the date of his enlistment, the period and term of his service, and his descriptive list. Said account shall be signed by the commanding officer and paymaster.

7. He shall cause frequent inspections to be made into the condition of the provisions on his ship and use every precaution for their preservation.

8. He shall frequently consult with the surgeon in regard to the sanitary condition of his crew and shall use all proper means to preserve their health. And he shall cause a convenient place to be set apart for sick or disabled men, to which he shall have them removed, with their hammocks and bedding, when the surgeon so advises, and shall direct that some of the crew attend them and keep the place clean.

9. He shall attend in person, or appoint a proper officer to attend, when his crew is finally paid off, to see that justice is done to the men and to the United States in the settlement of the accounts.

10. He shall cause the Articles for the Government of the Navy to be hung up in some public part of the ship and read once a month to his ship's company.

Every commanding officer who offends against the provisions of this article shall be punished as a court-martial may direct.

Article 21

When the crew of any vessel of the United States are separated from their vessel by means of her wreck, loss, or destruction, all the command and authority given to the officers of such vessel shall remain in full force until such ship's company shall be regularly discharged from or ordered again into service, or until a court-martial or court of inquiry shall be held to inquire into the loss of said vessel. And if any officer or man, after such wreck, loss, or destruction, acts contrary to the discipline of the Navy, he shall be punished as a court-martial may direct.

Article 22

(*a*) All offenses committed by persons belonging to the Navy which are not specified in the foregoing articles shall be punished as a court-martial may direct.

(*b*) Fraudulent enlistment, and the receipt of any pay or allowance thereunder, is hereby declared an offense against naval discipline and made punishable by general court-martial, under this article.

Article 23

All offenses committed by persons belonging to the Navy while on shore shall be punished in the same manner as if they had been committed at sea.

Article 24

No commander of a vessel shall inflict upon a commissioned or warrant officer any other punishment than private reprimand, suspension from duty, arrest, or confinement, and such suspension, arrest, or confinement shall not continue longer than 10 days, unless a further period is necessary to bring the offender to trial by a court-martial; nor shall he inflict, or cause to be inflicted, upon any petty officer, or person of inferior rating, or marine, for a single offense, or at any one time, any other than one of the following punishments, namely:

1. Reduction of any rating established by himself.
2. Confinement, not exceeding 10 days, unless further confinement be necessary in the case of a prisoner to be tried by court-martial.
3. Solitary confinement, on bread and water, not exceeding five days.
4. Solitary confinement not exceeding seven days.
5. Deprivation of liberty on shore.
6. Extra duties.

No other punishment shall be permitted on board of vessels belonging to the Navy, except by sentence of a court-martial. All punishments inflicted by the commander, or by his order, except reprimands, shall be fully entered upon the ship's log.

Article 25

(*a*) All officers of the Navy and Marine Corps who are authorized to order either general or summary courts-martial shall have the same authority to inflict minor punishments as is conferred by law upon the commander of a naval vessel.

(*b*) No officer who may command by accident, or in the absence of the commanding officer, except when such commanding officer is absent for a time by leave, shall inflict any other punishment than confinement.

Article 26

Summary courts-martial may be ordered upon petty officers and enlisted men in the naval service under his command by the commanding officer of any vessel, the commandant of any navy yard or naval station, the commanding officer of any brigade, regiment, or separate or detached battalion, or other separate or detached command, or marine barracks, and, when empowered by the Secretary of the Navy, by the commanding officer or officer in charge of any command not specifically mentioned in the foregoing, for the trial of offenses which such commanding officer or commandant may deem deserving of greater punishment than he is authorized to inflict, but not sufficient to require trial by a general court-martial.

Article 27

A summary court-martial shall consist of three officers not below the rank of ensign as members, and of a recorder. The commander of a ship may order any officer under his command to act as such recorder.

Article 28

Before proceeding to trial the members of a summary court-martial shall take the following oath or affirmation, which shall be administered by the recorder: "I, A B, do swear (*or* affirm) that I will well and truly try, without prejudice or partiality, the case now depending, according to the evidence which shall be adduced, the laws for the government of the Navy, and my own conscience." After which the recorder of the court shall take the following oath or affirmation, which shall be administered by the senior member of the court: "I, A B, do swear (*or* affirm) that I will keep a true record of the evidence which shall be given before this court and of the proceedings thereof."

Article 29

Except as provided in articles 60 and 68, all testimony before a summary court-martial shall be given orally, upon oath or affirmation, administered by the senior member of the court.

Article 30

Summary courts-martial may sentence petty officers and persons of inferior ratings to either a part or the whole, as may be appropriate, of any one of the following punishments, namely:

1. Discharge from the service with bad-conduct discharge; but the sentence shall not be carried into effect in a foreign country.
2. Solitary confinement, not exceeding 30 days, on bread and water or on diminished rations.
3. Solitary confinement, not exceedings 30 days.
4. Confinement not exceeding two months.
5. Reduction to next inferior rating.
6. Deprivation of liberty on shore on foreign station.
7. Extra police duties and loss of pay, not to exceed three months, may be added to any of the abovementioned punishments.

Article 31

A summary court-martial may disrate any rated person for incompetency.

Article 32

No sentence of a summary court-martial shall be carried into execution until the proceedings and sentence have been approved by the officer ordering the court, or his successor in office, and by his immediate superior in command: *Provided*, That if the officer ordering the court, or his successor in office, be the senior officer present, such sentence may be carried into execution upon his approval thereof, subject to the provisions of article 54 (*b*).

Article 33

The officer ordering a summary court-martial shall have power to remit, in part or altogether, but not to commute, the sentence of the court. And it shall be his duty either to remit any part of the whole of any sentence, the execution of which would, in the opinion of the surgeon or senior medical officer on board, given in writing, produce serious injury to the health of the person sentenced; or to submit the case again, without delay, to the same or to another summary court-martial, which shall have power, upon the testimony already taken, to remit the former punishment and to assign some other of the authorized punishments in the place thereof.

Article 34

The proceedings of summary courts shall be conducted with as much conciseness and precision as may be consistent with the ends of justice and under such forms and rules as may be prescribed by the Secretary of the Navy, with the approval of the President, and all such proceedings shall be transmitted in the usual mode to the Navy Department, where they shall be kept on file for a period of two years from date of trial.

Article 35

Any punishment which a summary court-martial is authorized to inflict may be inflicted by a general court-martial.

Article 36

No officer shall be dismissed from the naval service except by the order of the President or by sentence of a general court-martial; and in time of peace no officer shall be dismissed except in pursuance of the sentence of a general court-martial or in mitigation thereof: *Provided*, That the President is authorized to drop from the rolls of the Navy or Marine Corps any officer thereof who is absent from duty without leave for a period of three months or more, or who, having been found guilty by the civil authorities of any offense, is finally sentenced to confinement in a State or Federal penitentiary: *Provided further*, That no officer so dropped shall be eligible for reappointment.

Article 37

When any officer, dismissed by order of the President, makes, in writing, an application for trial, setting forth, under oath that he has been wrongfully dismissed, the President shall, as soon as the necessities of the service may permit, convene a court-martial to try such officer on the charges on which he shall have been dismissed. And if such court-martial shall not be convened within six months from the presentation of such application for trial, or if such court, being convened, shall not award dismissal or death as the punishment of such officer, the order of dismissal by the President shall be void: *Provided*, That the accounting officers are prohibited from making any allowance to any officer of the Navy who has been, or may hereafter be, dismissed from the service and restored to the same under the provisions of this article, to exceed more than pay as on leave for six months from the date of dismissal, unless it shall appear that the officer demanded in writing, addressed to the Secretary of the Navy, and continued to demand as often as once in six months, a trial as provided for in this article.

Article 38

General courts-martial may be convened:

(1) By the President, the Secretary of the Navy, the commander in chief of a fleet, and the commanding officer of a naval station or larger shore activity beyond the continental limits of the United States; and

(2) When empowered by the Secretary of the Navy, by the commanding officer of a squadron, division, flotilla, or larger naval force afloat, and of a brigade or larger force of the naval service on shore beyond the continental limits of the United States; and

(3) In time of war, if then so empowered by the Secretary of the Navy, by the commandant of any navy yard or naval station and by the commanding officer of a brigade or larger force of the Navy or Marine Corps, on shore not attached to a navy yard or naval station.

Article 39

A general court-martial shall consist of not more than 13 nor less than 5 commissioned officers as members; and as many officers, not exceeding 13, as can be convened without injury to the service, shall be summoned on every such court. But in no case, where it can be avoided without injury to the service, shall more than one-half, exclusive of the president, be junior to the officer to be tried. The senior officer shall always preside and the others shall take place according to their rank.

Article 40

The president of the general court-martial shall administer the following oath or affirmation to the judge advocate or person officiating as such:

"I, A B, do swear (*or* affirm) that I will keep a true record of the evidence given to and the proceedings of this court; that I will not divulge or by any means disclose the sentence of the court until it shall have been approved by the proper authority; and that I will not at any time divulge or disclose the vote or opinion of any particular member of the court, unless required so to do before a court of justice in due course of law."

This oath or affirmation being duly administered, each member of the court, before proceeding to trial, shall take the following oath or affirmation, which shall be administered by the judge advocate or person officiating as such:

"I, A B, do swear (*or* affirm) that I will truly try, without prejudice or partiality, the case now depending, according to the evidence which shall come before the court, the rules for the government of the Navy, and my own conscience; that I will not by any means divulge or disclose the sentence of the court until it shall have been approved by the proper authority; and that I will not at any time divulge or disclose the vote or opinion of any particular member of the court, unless required so to do before a court of justice in due course of law."

Article 41

An oath or affirmation in the following form shall be administered to all witnesses before any court-martial by the president thereof:

"You do solemnly swear (*or* affirm) that the evidence you shall give in the case now before this court shall be the truth, the whole truth, and nothing but the truth, and that you will state everything within your knowledge in relation to the charges. So help you God (*or*, 'this you do under the pains and penalties of perjury')."

Article 42

(*a*) Whenever any person refuses to give his evidence or to give it in the manner provided by these articles, or prevaricates, or behaves with contempt to the court, it shall be lawful for the court to imprison him for any time not exceeding two months: *Provided*, That the person charged shall, at his own request but not otherwise, be a competent witness before a court-martial or court of inquiry, and his failure to make such request shall not create any presumption against him.

(*b*) A naval court-martial or court of inquiry shall have power to issue like process to compel witnesses to appear and testify which United States courts of criminal jurisdiction with the State, Territory, or District where such naval court shall be ordered to sit may lawfully issue.

(*c*) Any person duly subpenaed to appear as a witness before a general court-martial or court of inquiry of the Navy, who willfully neglects or refuses to appear, or refuses to qualify as a witness or to testify or produce documentary evidence, which such person may have been legally subpenaed to produce, shall be deemed guilty of a misdemeanor, for which such person shall be punished on information in the district court of the United States; and it shall be the duty of the United States district attorney, on the certification of the facts to him by such naval court to file an information against and prosecute the person so offending, and the punishment of such person, on conviction, shall be a fine of not more than $500 or imprisonment not to exceed six months, or both, at the discretion of the court: *Provided*, That this shall not apply to persons residing beyond the State, Territory, or District in which such naval court is held, and that the fees of such witness and his mileage at the rates provided for witnesses in the United States district court for said State, Territory, or District shall be duly paid or tendered said witness, such amounts to be paid by the Bureau of Supplies and Accounts out of the appropriation for compensation of witnesses: *Provided further*, That no witness shall be compelled to incriminate himself or to answer any question which may tend to incriminate or degrade him.

Article 43

The person accused shall be furnished with a true copy of the charges, with the specifications, at the time he is put under arrest; and no other charges than those so furnished shall be urged against him at the trial, unless it shall appear to the court that intelligence of such other charge had not reached the officer ordering the court when the accused was put under arrest, or that some witness material to the support of such charge was at that time absent and can be produced at the trial, in which case reasonable times shall be given to the accused to make his defense against such new charge.

Article 44

Every officer who is arrested for trial shall deliver up his sword to his commanding officer and confine himself to the limits assigned him, on pain of dismissal from the service.

Article 45

When the proceedings of any general court-martial have commenced they shall not be suspended or delayed on account of the absence of any of the members, provided five or more are assembled; but the court is enjoined to sit from day to day, Sundays excepted, until sentence is given, unless temporarily adjourned by the authority which convened it.

Article 46

No member of a general court-martial shall, after the proceedings are begun, absent himself therefrom except in case of sickness or of an order to go on duty from a superior officer, on pain of being cashiered.

Article 47

Whenever any member of a court-martial from any legal cause is absent from the court after the commencement of a case, all the witnesses who have been examined during his absence must, when he is ready to resume his seat, be recalled by the court and the recorded testimony of each witness so examined must be read over to him, and such witness must acknowledge the same to be correct and be subject to such further examination as the said member may require. Without a compliance with this rule, and an entry thereof upon the record, a member who shall have been absent during the examination of a witness shall not be allowed to sit again in that particular case.

Article 48

Whenever a court-martial sentences an officer to be suspended, it may suspend his pay and emoluments for the whole or any part of the time of his suspension.

Article 49

In no case shall punishment by flogging, or by branding, marking, or tattooing on the body be adjudged by any court-martial or be inflicted upon any person in the Navy. The use of irons, single or double, is abolished, except for the purpose of safe custody or when part of a sentence imposed by a general court-martial.

Article 50

No person shall be sentenced by a court-martial to suffer death, except by the concurrence of two-thirds of the members present, and in the cases where such punishment is expressly provided in these articles. All other sentences may be determined by a majority of votes.

Article 51

It shall be the duty of a court-martial, in all cases of conviction, to adjudge a punishment adequate to the nature of the offense; but the members thereof may recommend the persons convicted as deserving of clemency, and state, on the record, their reasons for so doing.

Article 52

The judgment of every court-martial shall be authenticated by the signature of the president and of every member who may be present when said judgment is pronounced, and also of the judge advocate.

Article 53

No sentence of a court-martial, extending to the loss of life or to the dismissal of a commissioned or warrant officer, shall be carried into execution until confirmed by the President. All other sentences of a general court-martial may be carried into execution on confirmation of the commander of the fleet or officer ordering the court.

Article 54

(*a*) Every officer who is authorized to convene a general court-martial shall have power, on revision of its proceedings, to remit or mitigate, but not to commute, the sentence of any such court which he is authorized to approve and confirm.

(*b*) The Secretary of the Navy may set aside the proceedings or remit or mitigate, in whole or in part, the sentence imposed by any naval court-martial convened by his order or by that of any officer of the Navy or Marine Corps.

Article 55

Courts of inquiry may be convened by the President, the Secretary of the Navy, the commander of a fleet or squadron, and by any officer of the naval service authorized by law to convene general courts-martial.

Article 56

A court of inquiry shall consist of not more than three commissioned officers as members, and of a judge advocate, or person officiating as such.

Article 57

Courts of inquiry shall have power to summon witnesses, administer oaths, and punish contempts in the same manner as courts-martial; but they shall only state facts, and shall not give their opinion unless expressly required so to do in the order for convening.

Article 58

The judge advocate, or person officiating as such, shall administer to the members the following oath or affirmation: "You do swear (*or* affirm) well and truly to examine and inquire, according to the evidence, into the matter now before you without partiality." After which the president shall administer to the judge advocate, or person officiating as such, the following oath or affirmation: "You do swear (*or* affirm) truly to record the proceedings of this court and the evidence to be given in the case in hearing."

Article 59

The party whose conduct shall be the subject of inquiry, or his attorney, shall have the right to cross-examine all the witnesses.

Article 60

The proceedings of courts of inquiry shall be authenticated by the signature of the president of the court and of the judge advocate, and shall, in all cases not capital nor extending to the dismissal of a commissioned or warrant officer, be evidence before a court-martial, provided oral testimony cannot be obtained.

Article 61

No person shall be tried by court-martial or otherwise punished for any offense, except as provided in the following article, which appears to have been committed more than two years before the issuing of the order for such trial or punishment, unless by reason of having absented himself or of some other manifest impediment he shall not have been amenable to justice within that period.

Article 62

No person shall be tried by court-martial or otherwise punished for desertion in time of peace, committed more than two years before the issuing of the order for such trial or punishment, unless he shall meanwhile have absented himself from the United States or by reason of some other manifest impediment shall not have been amenable to justice within that period, in which case the time of his absence shall be excluded in computing the period of the limitation: *Provided,* That said limitation shall not begin until the end of the term for which said person was enlisted in the service.

Article 63

Whenever, by any of the Articles for the Government of the Navy of the United States, the punishment on conviction of an offense is left to the discretion of the court-martial, the punishment therefor shall not, in time of peace, be in excess of a limit which the President may prescribe.

Article 64

(*a*) All officers of the Navy and Marine Corps who are authorized to order either general or summary courts-martial may order deck courts upon enlisted men under their command, for minor offenses now triable by summary court-martial.

(*b*) Deck courts shall consist of one commissioned officer only, who, while serving in such capacity shall have power to administer oaths, to hear and determine cases, and to impose either a part or the whole, as may be appropriate, of any one of the punishments prescribed by article 30 of the Articles for the Government of the Navy: *Provided,* That in no case shall such courts adjudge discharge from the service or adjudge confinement or forfeiture of pay for a longer period than 20 days.

(*c*) Any person in the Navy under command of the officer by whose order a deck court is convened may be detailed to act as recorder thereof.

(*d*) All sentences of deck courts may be carried into effect upon approval of the convening authority or his successor in office, who shall have full power as reviewing authority to remit or mitigate, but not to commute, any such sentence and to pardon any punishment such court may adjudge; but no sentence of a deck court shall be carried into effect until it shall have been so approved or mitigated.

(*e*) Deck courts shall be governed in all details of their constitution, powers, and procedure, except as herein provided, by such rules and regulations as the President may prescribe.

(*f*) The records of the proceedings of deck courts shall contain such matters only as are necessary to enable the reviewing authorities to act intelligently thereon, except that if the party accused demands it within 30 days after the decision of the deck court shall become known to him, the entire record or so much as he desires shall be sent to the reviewing authority. Such records, after action thereon by the convening authority, shall be forwarded directly to, and shall be filed in, the office of the Judge Advocate General of the Navy, where they shall be reviewed, and, when necessary, submitted to the Secretary of the Navy for his action.

(*g*) No person who objects thereto shall be brought to trial before a deck court. Where such objection is made by the person accused, trial shall be ordered by summary or by general court-martial, as may be appropriate.

Article 65

When actively serving under the Navy Department in time of war or during the existence of an emergency, pursuant to law, as a part of the naval forces of the United States, commissioned officers of the Naval Reserve, Marine Corps Reserve, Coast Guard, Lighthouse Service, Coast and Geodetic Survey, and Public Health Service are empowered to serve on naval courts-martial and deck courts under such regulations necessary for the proper administration of justice and in the interests of the services involved, as may be prescribed by the Secretary of the Navy.

Article 66

When empowered by the Secretary of the Navy pursuant to article 26 to order summary courts-martial, the commanding officer of a naval hospital or hospital ship shall be empowered to order such courts and deck courts, and inflict the punishments which the commander of a naval vessel is authorized by law to inflict, upon all enlisted men of the naval service attached thereto, whether for duty or as patients.

Article 67

When a force of marines is embarked on a naval vessel, or vessels, as a separate organization, not a part of the authorized complement thereof, the authority and powers of the officers of such separate organization of marines shall be the same as though such organization were serving at a navy yard on shore, but nothing herein shall be construed as impairing the paramount authority of the commanding officer of any naval vessel over the vessel under his command and all persons embarked thereon.

Article 68

The depositions of witnesses may be taken on reasonable notice to the opposite party, and when duly authenticated, may be put in evidence before naval courts, except in capital cases and cases where the punishment may be imprisonment or confinement for more than one year as follows:

(1) Depositions of civilian witnesses residing outside the State, Territory, or District in which a naval court is ordered to sit.

(2) Depositions of persons in the naval or military service stationed or residing outside the State, Territory or District in which a naval court is ordered to sit, or who are under orders to go outside of such State, Territory, or District.

(3) Where such naval court is convened on board a vessel of the United States, or at a naval station not within any State, Territory, or District of the United States, the depositions of witnesses may be taken and used as herein provided whenever such witnesses reside or are stationed at such a distance from the place where said naval court is ordered to sit, or are about to go to such a distance as, in the judgment of the convening authority, would render it impracticable to secure their personal attendance.

Article 69

Judges advocate of naval general courts-martial and courts of inquiry, and all commanders in chief of naval squadrons, commandants of navy yards and stations, officers commanding vessels of the Navy, and recruiting officers of the Navy, and the Director of Personnel, Marine Corps, commanding officers, recruiting officers of the Marine Corps, and such other officers of the Regular Navy and Marine Corps, of the Naval Reserve, and of the Marine Corps Reserve, as may be hereafter designated by the Secretary of the Navy, are authorized to administer oaths for the purposes of the administration of naval justice and for other purposes of naval administration.

Article 70

Any officer of the Navy or Marine Corps detailed to conduct an investigation, and the recorder, and if there be none the presiding officer, or any naval board appointed for such purpose, shall have authority to administer an oath to any witness attending to testify or depose in the course of such investigation.

DECORATIONS, MEDALS, AND RIBBONS

Manner of Wearing Ribbons

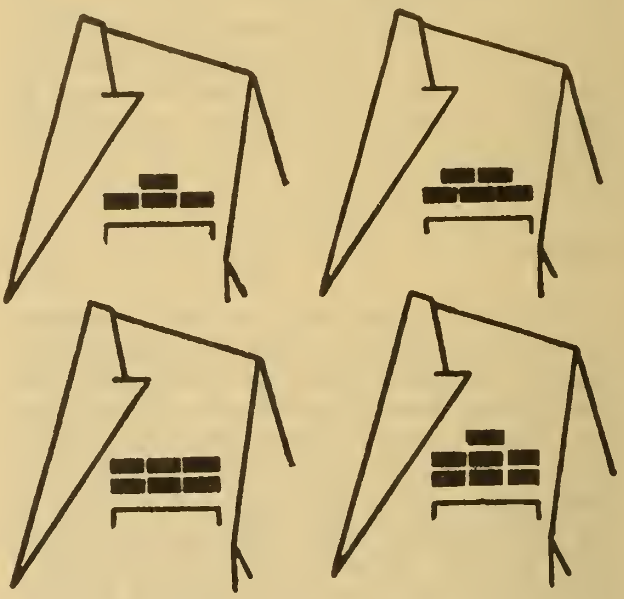
The following is a summary of the regulations governing the issuance and wearing of awards now designated for naval personnel. It should be noted that during time of war, only the ribbon bars of the decorations and medals are worn, even for full-dress occasions.

Ribbons of decorations, medals, and badges are worn in horizontal rows of three each. Any row with less than three ribbons becomes the top row and is centered over the row or rows beneath it.

The ribbons are to be worn on the left breast clear of the lapel, as far as practicable. The upper edge of the main, or bottom, row should be on a line one inch below the point of the shoulder (a point halfway between top and bottom of the shoulder joint, where the sleeve is joined).

The arrangement by seniority (see table) is from top down and from inboard outboard. For wearing of Army or foreign decorations, see page 565.

Drawings below show the manner in which ribbons are worn:



PROPER MANNER OF WEARING RIBBONS

Stars, Service Clasps, Letters

Gold, silver, or bronze stars, service clasps, and letters (such as "A" and "W") are authorized to be worn on various medals and service ribbons. Numerals are not authorized.

No more than one decoration of the same type may be awarded to any one person, but in lieu of a subsequent award of the same decoration, a gold star is awarded, to be worn on the ribbon.

Stars, clasps, and letters are authorized for other medals and ribbons as follows:

Expeditionary Medal (Navy, Marine Corps): A bronze star is worn for each expedition in excess of one. Navy and Marine Corps personnel who served in the defense of Wake Island, 7 to 22 December 1941, wear a silver "W" on the appropriate Expeditionary Medal ribbon.

Victory Medal (World War I service medal): Service clasps and battle clasps, to be worn on the ribbon of the medal, are authorized for each person who performed any of the duties designated in *Bureau of Naval Personnel Manual*, Art. A-1037, par. (2). Clasps for service on ships are awarded as shown in the list in paragraph (5) of the same article.

No one is entitled to more than one service clasp, or to more than one Meuse-Argonne battle clasp. A bronze star is worn on the service ribbon bar in lieu of any clasp authorized.

When any person has been commended by the Secretary of the Navy, as a result of the recommendation of the board of awards, for performance of duty during World War I not justifying the award of a Medal of Honor, a Distinguished Service Medal or a Navy Cross, he wears a silver star for each such citation.

A bronze Maltese cross is placed on the service ribbon for those officers and men of the Marine Corps and Medical Corps, United States Navy, who were attached to the American Expeditionary Forces in France any time between 6 April 1917 and 11 November 1918, and who are not entitled to any battle clasp provided for by General Order No. 83, War Department, 30 June 1919.

American Defense Service Medal: A service clasp, "Fleet" or "Base," is worn on the ribbon of the medal by those who, between 8 September 1939 and 7 December 1941, inclusive, performed duties set forth in the following paragraphs. No such person is entitled to more than one such clasp.

1. *Fleet.* For service on the high seas while regularly attached to any vessel or aircraft squadron of the Atlantic, Pacific, or Asiatic Fleets; to include vessels of the Naval Transportation Service and vessels operating directly under the Chief of Naval Operations.

2. *Base.* For service on shore at bases and naval stations outside the continental limits of the United States. (Includes duty in Alaska.)

A bronze star is worn on the service ribbon in lieu of any clasp authorized.

Navy, Marine Corps, and Coast Guard personnel who served on vessels in actual or potential belligerent contact with Axis forces in the Atlantic Ocean (as listed in *Bureau of Naval Personnel Manual*, Art. A-1042) wear a bronze "A" on their service ribbon in lieu of the bronze star.

Naval Reserve personnel on training duty under orders must have served at least 10 days in such duty. Persons ordered to active duty for physical examination and subsequently disqualified are not entitled to the American Defense Service Medal. Reserve officers ordered to ships of the fleet for training duty (cruise) and officers serving on board ships for temporary additional duty from shore stations are not considered "regularly attached" and are not entitled to the fleet clasp.

Area campaign medals (American, European-African-Middle Eastern, Asiatic-Pacific): A bronze star is worn on the service ribbon for certain authorized operations and engagements (complete list to date appears in NavPers 15790, Sect. 49). For five or more such operations or engagements, a silver star is worn on the ribbon in lieu of each five bronze stars authorized.

Good-Conduct Medal: A Good-Conduct Medal is issued as the first award to an individual and a pin for each subsequent award. A bronze star is worn on the service ribbon for each good-conduct clasp that is received. A silver star is worn in lieu of 5 bronze stars.

Naval Reserve Medal: A bronze star is worn on the ribbon for each *additional* 10 years of honorable service.

Commendation Ribbon: A second authorization, and each succeeding authorization, to wear the Commendation Ribbon is represented by a bronze star on the ribbon.

Army Ribbons

Ribbons of medals and badges awarded to naval personnel by the Army, or won by naval personnel during previous service in the Army, may be worn on naval uniforms in proper order of seniority.

Some of the Army awards, and the Navy ribbon they follow when worn by naval personnel, are: Medal of Honor (follows Navy's Medal of Honor), Distinguished Service Cross (follows Navy Cross), Distinguished Service Medal (follows Navy's DSM), Soldier's Medal (follows Navy and Marine Corps Medal), and Distinguished Unit Badge (follows Presidential Unit Citation).

The Army's Distinguished Unit Emblem is worn by Army personnel on the right breast. However, when awarded to naval personnel, it is worn on the left breast along with other ribbons. Anyone who served in the defense of the Philippines at any time between 7 December 1941 and 9 April 1942 is eligible for this badge and may apply to the Bureau of Naval Personnel via his commanding officer.

Anyone who has good reason to believe he is entitled to any other Army medal (such as the Good-Conduct Medal) for previous Army service may have this determined by the Decorations Section, Adjutant General's Office, Army or Air Force. Any letters sent there should be via the commanding officer.

Foreign Decorations

When authorized by law, foreign decorations or service medals may be worn. They are worn on the same occasions as prescribed for American decorations, service medals or badges and should be arranged in the order of the date of receipt after all American decorations, service medals or badges, except that when one individual possesses two or more decorations from the same foreign country, the order of precedence of those particular decorations shall be determined by the rules of the country concerned. Foreign decorations should be tendered through the Department of State.

Naval personnel who won the right to wear the French Fourragere by serving in units awarded it in World War I may wear it with their naval uniforms under certain conditions.

Navy Good Conduct Medal

The Good Conduct Medal when first established, was an award given not for an act of valor, winning any Navy trophy, or otherwise getting in the spotlight, but was given in recognition of approximately four years of steady plugging, attention to duty, performance of hard and often unpleasant tasks under difficult and trying conditions; of cheerfully and willingly carrying out orders, returning to station of duty immediately upon expiration of leave or liberty, and in general, loyalty to the oath of enlistment. Further, the qualification of the 3.5 in proficiency in rating makes the award a testimonial that the ability of the holder is above the average. There is no question but that a Good Conduct Award stamps its holder as the highest type of seafaring man. Awarded for: Fidelity, zeal, obedience.

Good Conduct Medals and Clasps are issued to enlisted personnel by the Chief of Naval Personnel. A medal will be issued as the first award. A clasp to be worn on the suspension ribbon of the medal will be issued for each subsequent award. A bronze star three-sixteenths of an inch in diameter shall be worn on the ribbon bar of the medal for each such clasp awarded. A silver star five-sixteenths of an inch shall be worn in lieu of five bronze stars. The wearing of the ribbon bar and of bronze stars thereon will be authorized by commanding officers upon fulfillment of the necessary requirements. Appropriate entries to that effect will be made on page 9 of the service record, and recommendation for issuance of the medal or clasp will be forwarded to the Chief of Naval Personnel. Recommendations for posthumous awards will be made to the Chief of Naval Personnel.

Service Stripes

Service stripes are worn by enlisted men on the left sleeve of coats and jumpers. One service stripe is worn for each four years of active duty in the Navy, Marine Corps, Coast Guard, or Army or active service in the Naval Reserve or any combinations thereof. Although not a decoration or medal, the service stripe is included in this section because of its relation to the Good Conduct Medal previously discussed.

The stripes are seven inches long, of scarlet cloth when worn on blue clothes, of blue twill when worn on white, khaki, or green clothes.

Stripes are stitched on the sleeve diagonally across the outside of the forearm at a 45-degree angle. On coats, the lower end of the first stripe shall be not less than two inches from the cuff end of the sleeve; on jumpers, it shall be four inches above the upper edge of the cuff.

Gold lace service stripes are worn by enlisted men holding three consecutive Navy Good Conduct Medals or have twelve years' continuous active duty in the Navy and/or Naval Reserve during which time records have been maintained with marks and qualifications equivalent to those necessary for the receipt of Navy Good Conduct Medals, provided that in no case shall a man with less than twelve years' continuous active duty in the Navy and/or Naval Reserve be entitled to wear the gold lace service stripes. When gold lace service stripes are worn, gold rating badges must be worn. Having once won the right to wear gold lace service stripes, this right continues throughout the duration of an enlisted person's service unless in an enlistment subsequent to the one in which the right to wear gold lace service stripes was established he fails to qualify for a Navy Good Conduct Medal, in which case the right to wear gold lace service stripes shall be terminated.

Unit Citations

The Presidential Unit Citation may be awarded to a ship, aircraft or other naval unit, and to any Marine Corps aircraft detachment, or higher unit, for outstanding performance in action on or after 16 October 1941.

Under original regulations, the ribbon could not be worn until after the second unit citation. This was modified by AlNav 137-43 as follows:

1. When a unit has received the Presidential Unit Citation, all personnel serving in that unit during the occasion for which cited, or any part thereof, wear the citation ribbon with one star permanently, regardless of where they serve.
2. Such personnel wear an additional star for each additional citation of the unit upon which they serve during the occasion for which the unit is cited, whether it be the same or another unit.
3. Personnel who subsequently join a unit which has been cited wear the plain citation ribbon without star and only while attached to that unit.
4. Flag officers and members of their staffs serving in a unit upon the occasion for which cited, or any part thereof, are included in the citation.

When medals are worn, the Presidential Unit Citation is worn on the right breast; otherwise, on the left, with other ribbons.

The insigne for units cited is a burgee pennant of blue, gold and scarlet.

Ships, aircraft, and tank units, etc., display a bronze plaque with this design centered above the engraved citation (individual planes and tanks may paint the design in a suitable place). For companies, battalions, regiments, etc., a battle streamer is authorized, with the citation engraved upon the standard.

In time of peace, ships may also fly the pennant itself, and may display a painted pennant of insignia design from some place on the top hamper so as to be visible to other units.

If a unit is cited more than once, a blue star is added for each extra citation, up to five starts.

Commanders of forces afloat make recommendations to the Secretary of the Navy via official channels for the Presidential Unit Citation for units of their commands deemed worthy of it. Units must perform services in action above and beyond the high standard expected of our forces and outstanding as compared to services of comparable units in the same or similar actions.

Additional Decorations, Medals, and Badges

The following are in addition to the United States Navy decorations previously mentioned:

United States of America Typhus Commission Medal. May be awarded by the President of the United States or at his direction to any person who may render or contribute meritorious service in connection with the work of the Typhus Commission. (Executive Order No. 9285 of 24 December 1942.)

Relative Standing of Different Awards Showing Order in Which Their Ribbons Are to Be Worn

Ribbons of medals or badges awarded for service performed while in the Army, Marine Corps, Coast Guard, or other branch of the Government, if not included in the following, should be worn in the order specified by the respective Services. In all cases of relative priority Navy decorations, medals, or badges take precedence.

Medal of Honor
Marine Corps Brevet Medal
Navy Cross
Distinguished Service Cross
Distinguished Service Medal
Silver Star Medal
Legion of Merit
Distinguished Flying Cross
Navy and Marine Corps Medal
Soldier's Medal
Bronze Star Medal
Air Medal
Commendation Ribbon
Purple Heart
Specially Meritorious Medal (no longer awarded)
Presidential Unit Citation
Distinguished Unit Emblem (worn by naval personnel on left breast with other awards)
Navy Unit Commendation
Gold Life Saving Medal (old and new)
Silver Life Saving Medal (old and new)
Reserve Special Commendation Ribbon
Navy Good Conduct Medal
Marine Corps Good Conduct Medal
Army Good Conduct Medal
Coast Guard Good Conduct Medal
Naval Reserve Medal
Organized Marine Corps Reserve Medal
Dewey Medal
Sampson Medal
Peary Polar Expedition Medal
NC-4 Medal
Byrd Antarctic Expedition Medal (1928-30)
Second Byrd Antarctic Expedition Medal (1933-35)
U. S. Antarctic Expedition Medal (1939-41)
Civil War Campaign Medal
Indian Campaign Medal
Expeditionary Medal
Spanish Campaign Medal
Spanish War Service Medal
Army of Puerto Rican Occupation
Army of Cuban Occupation
Philippine Campaign Medal
Philippine Congressional Medal
China Relief Expedition Medal
China Campaign Medal
Cuban Pacification Medal
Army of Cuban Pacification Medal
Nicaraguan Campaign Medal (1912)
Mexican Service Medal
Haitian Campaign Medal (1915)
Mexican Border Service Medal
Dominican Campaign Medal
Victory Medal—World War I
Army of Occupation of Germany Medal (1918-23)
Haitian Campaign Medal (1919-20)
Second Nicaraguan Campaign Medal
Yangtze Service Medal
China Service Medal [1]
American Defense Service Medal
Area Campaign Medals (worn in order earned):
  (1) American Area Campaign Medal
  (2) European-African-Middle Eastern Area Campaign Medal
  (3) Asiatic-Pacific Area Campaign Medal
Victory Medal—World War II
China Service Medal [2]
Navy Occupation Service Medal [3]
Marine Corps Reserve Ribbon
Army of Occupation Medal
Philippine Defense Ribbon
Philippine Liberation Ribbon
Philippine Independence Ribbon
Admiral Trenchard Section, Navy League, Turret-Gun-Pointer Medal
Knox Trophy Gun-Pointer Medal
Bailey Medal
Merchant Marine Distinguished Service Medal
Merchant Marine Meritorious Service Medal
Merchant Marine Gallant Ship Unit Citation
Merchant Marine Mariners Medal
Merchant Marine Combat Bar
Merchant Marine Defense Bar
Merchant Marine War Zone Bars (worn in order earned):
  (1) Atlantic War Zone
  (2) Mediterranean Middle-East War Zone
  (3) Pacific War Zone

The following is the order for medals or badges for excellence in small arms firing. When ribbons are prescribed, any of these medals or badges not having a ribbon may be worn one-fourth inch below the center of the bottom row of ribbons.

Expert team rifleman's medal (no longer issued)
Expert rifleman's bar (no longer issued)
Sharpshooter's medal (no longer issued)
Expert pistol shot's pin (no longer issued)
Navy, Marine Corps, Coast Guard distinguished marksman's medal
Navy, Marine Corps, Coast Guard distinguished pistol shot's medal
Fleet rifleman's badge
Fleet pistol shot's badge
Navy and Coast Guard expert rifleman's medal
Marine Corps expert rifleman's badge
Navy and Coast Guard expert pistol shot's medal
Marine Corps expert pistol shot's badge

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[1] For service prior to World War II. If also awarded for service subsequent to 2 September 1945, bronze star shall be worn on ribbon.

[2] If awarded for service after 2 September 1945. If person is also authorized to wear Navy Occupation Medal, the medal which was awarded first shall take precedence.

[3] If person is also authorized to wear China Service Medal (awarded for service performed subsequent to September, 1945), the medal which was awarded first shall take precedence.

Life-Saving Decorations (awarded by Treasury Department). *Gold Life-Saving Medals* may be awarded persons who, by extreme and heroic daring, have endangered their lives in saving or endeavoring to save lives from the perils of the sea in waters over which the United States has jurisdiction, or upon American vessels.

Silver Life-Saving Medals may be awarded in cases not sufficiently distinguished to deserve the gold medal.

Commemorative Medals. *Dewey Medal* (commemorating the Battle of Manila Bay). Issued to officers and men of the ships of the Asiatic Squadron of the United States under the command of Commodore George Dewey on 1 May 1898. The ships are listed in Sect. 27, NavPers 15790. (Act of 3 June 1898.)

Sampson Medal (commemorating naval engagements in the West Indies). Issued to officers and men of Navy and Marine Corps who participated in the naval and other engagements in West Indies waters and on the shores of Cuba during the war with Spain, deemed by the Secretary of the Navy to be of sufficient importance to deserve commemoration. (Act of 3 March 1901.)

Peary Polar Expedition Medal (1908-09). Issued to certain individuals in recognition of their efforts and services as members of the Peary Polar Expedition of 1908-09 in the field of science by aiding in the discovery of the North Pole by Admiral Peary. (Act 28 Jan. 1944.)

NC-4 Medal (commemorating the first transatlantic flight of the United States naval flying boat in May 1919). Issued to members of the *NC-4* for their extraordinary achievement. (Act of 9 February 1929.)

Byrd Antarctic Expedition Medal (1928-30). Issued to officers and men of the expedition for their heroic and undaunted services in connection with the scientific investigations and extraordinary aerial explorations of the Antarctic continent. (Act of 23 May 1930.)

Second Byrd Antarctic Expedition Medal (1933-35). Issued to the deserving personnel of that expedition that spent the winter night at Little America or who commanded either one of the expedition ships throughout the expedition, for their heroic and undaunted accomplishments for science, unequaled in the history of polar exploration. (Act of 2 June 1936.)

U. S. Antarctic Expedition Medal (1939-41). Issued to members U. S. Antarctic Expedition 1939-41 in recognition of their valuable services to the nation in the field of polar exploration and science. (Act of 24 Sept. 1945.)

Service Medals. *Civil War Medal.* Issued to officers and enlisted men of the Navy who served in the Navy during the Civil War, between 15 April 1861 and 9 April 1865.

Expeditionary Medal (Navy and Marine Corps, initial award 1874). Awarded to officers and enlisted men of Navy and Marine Corps who landed on foreign territory and engaged in operations against armed opposition, or operated under circumstances deemed to merit special recognition and for which service no campaign medal has been awarded. (Authorized expeditions and dates are listed in Sect. 35, NavPers 15790.)

For each expedition in excess of one, a bronze star is issued, to be worn on the ribbon. The medal may be awarded to officers and men separated from the service under honorable conditions. Personnel who served in the defense of Wake Island 7 to 22 December 1941 wear a silver "W" on the suspension ribbon or service ribbon bar.

Spanish Campaign Medal. Issued to all who were in the Naval Service between 20 April and 10 December 1898.

Philippine Campaign Medal. Issued to officers and men of the Navy who served in Philippine waters and were attached to one of the vessels listed in Sect. 37, NavPers 15790, between the dates designated.

China Relief Expedition Medal (1900-1901). Issued to officers and men of the Navy who served in Chinese waters and were attached to one of the vessels listed in Sect. 38, NavPers 15790, between the dates designated.

Cuban Pacification Medal. Issued to all officers and men of the Navy or who have been in the Navy and who served ashore in Cuba between the dates of 12 September 1906 and 1 April 1909, or who were attached to any one of the vessels listed in Sect. 39, NavPers 15790, between the dates designated.

Nicaraguan Campaign Medal (1912). Issued to officers and men of Navy and Marine Corps who served in Nicaragua or on board any of the vessels listed in Sect. 40, NavPers 15790, between 29 July and 14 November 1912.

Mexican Service Medal. Issued to all officers and men of Navy and Marine Corps who served on shore at Vera Cruz from 21 to 23 April 1914 inclusive, or on board any of the vessels listed in Sect. 41, NavPers 15790, between the dates designated.

Haitian Campaign Medal (1915). Issued to any officer or man of Navy or Marine Corps who served in Haiti during the period from 9 July to 6 December 1915, or any part of such period; also officers and men who were attached to vessels listed in Sect. 42, NavPers 15790, between the dates designated.

Dominican Campaign Medal. Issued to commemorate services performed by Navy and Marine Corps personnel during operations in Santo Domingo from

TABLE OF NAVAL DECORATIONS AND REGULATIONS

Name of Medal and Ribbon	To Whom Awarded	Awarded for	Time Limits for Recommendations or Awards	Gratuity
Medal of Honor	Any person who, while in the naval service of the United States shall, in action involving actual combat with the enemy, or in the line of his profession, distinguish himself conspicuously by gallantry and intrepidity at the risk of his life above and beyond the call of duty and without detriment to the mission.	Combat or noncombat	Must be issued within 5 years from date of distinguished act, or recommended within 3 years of act, or service.	$2 per month from date of distinguished act, to enlisted men only.
Medal of Honor (1917-18) (no longer issued)	Any person who, while in the naval service of the United States shall, in action involving actual conflict with the enemy, distinguish himself conspicuously by gallantry and intrepidity at the risk of his life above and beyond the call of duty and without detriment to the mission.	Combat only	Do.	Do.
Navy Cross	Any person serving with the naval service of the United States who distinguishes himself by extraordinary heroism in connection with military operations against an armed enemy.	Combat only	Do.	Do.
Distinguished Service Medal	Any person who, while serving in any capacity with the Navy of the United States since 6 Apr. 1917, has distinguished himself by exceptionally meritorious service to the Government in a duty of great responsibility.	Combat or noncombat	Do.	Do.
Legion of Merit	Personnel of the armed forces of the United States and the Philippines: and personnel of the armed forces of friendly nations who, since 8 Sept. 1939, shall have distinguished themselves by exceptionally meritorius conduct in the performance of outstanding services.	Combat or noncombat	No time limit.	No gratuity provided.
Silver Star Medal	Any person who, while serving in any capacity with the Navy of the United States since 6 Dec. 1941, has distinguished himself conspicuously by gallantry and intrepidity in action, not sufficient to justify the award of Medal of Honor or Navy Cross; also cases of persons previously submitted, recommended for Medal of Honor or Navy Cross or Distinguished Service Medal, and who were turned down, may be reconsidered, all cases to be considered on records now in Navy Department.	Combat only	Must be issued within 5 years from date of distinguished act or service, or recommended within 3 years, except in cases submitted previous to 7 Aug. 1942 and turned down for award of Medal of Honor, Distinguished Service Medal or Navy Cross.	$2 per month from date of distinguished act, for enlisted men only, since 6 Dec. 1941.
Distinguished Flying Cross	Any person who, while serving in any capacity with the Air Corps of the Army, National Guard, and Organized Reserves, or with U. S. Navy, Marine Corps or Coast Guard, subsequent to 6 Apr. 1917, has distinguished himself by heroism or extraordinary achievement while participating in aerial flight. Members of military, naval, or air forces of foreign governments while serving with the United States.	Combat or noncombat	Must be issued within 3 years from date of distinguished act or service, or recommended within 2 years from date of act or service.	$2 per month from date of distinguished act or service, for enlisted men only.
Navy and Marine Corps Medal	Any person who, while serving in any capacity with the U. S. Navy or Marine Corps, including Reserves, shall have, since 6 Dec. 1941, distinguished himself or herself by heroism not involving actual conflict with an enemy, or to any person to whom the Secretary of the Navy has formerly awarded a letter of commendation for heroism, regardless of date, subject to approval of the Board of Decorations and Medals.	Noncombat only	Must be issued within 5 years from date of distinguished act or service, or recommended within 3 years, except when submitted previous to 7 Aug. 1942 and turned down for award of Medal of Honor, Distinguished Service Medal or Navy Cross, or when awarded in lieu of a letter of commendation previously awarded for heroism.	No gratuity for services prior to 7 Dec. 1941; $2 per month from date of distinguished act, after 7 Dec. 1941, for enlisted men only
Bronze Star Medal	Any person serving with Army, Navy, Marine Corps or Coast Guard on or after 7 Dec. 1941 who distinguishes himself by heroic or meritorious achievement or service, not involving participation in aerial flight, in connection with military or naval operations against an enemy.	Combat or noncombat	No time limit.	No gratuity authorized.
Air Medal	Any person who, while serving with Army, Navy, Marine Corps or Coast Guard of the United States in any capacity, subsequent to 8 Sept. 1939, distinguishes himself by meritorious achievement while participating in an aerial flight.	Combat or noncombat	No time limit.	No gratuity authorized.
Commendation Ribbon	All personnel of Navy, Marine Corps and Coast Guard who receive an individual letter of commendation signed by SecNav, Cominch, CinCPac or CinCLant, or a Fleet Commander of rank of Vice Admiral or above, for an act of heroism or service performed since 6 Dec. 1941 (but ribbon may not be worn for letters received after 11 Jan. 1944 unless text so authorizes, or for any letters from Fleet Commanders prior to 13 Sept. 1944).	Combat or noncombat	No time limit.	No gratuity authorized.
Purple Heart	Persons wounded in action against the enemy of the United States while serving with the Navy, Marine Corps, or Coast Guard of the United States or as result of act of such enemy, if wound necessitated treatment by medical officer. Also to next of kin of persons killed in action.	Combat only	No time limit.	No gratuity authorized.
Specially Meritorious Medal, War with Spain (no longer issued)	Officers and men of the Navy and Marine Corps who rendered specially meritorious service, other than in battle, during War with Spain.	Noncombat only	No time limit.	No gratuity authorized.
Presidential Unit Citation	Any ship, aircraft, or naval units, any marine aircraft detachment or higher unit for outstanding performance in action on or after 16 Oct. 1941.	Combat only	No time limit	No gratuity authorized.

5 May to 4 December 1916; also the officers and men who were attached to the vessels listed in Sect. 43, NavPers 15790, between the dates designated.

Victory Medal (World War Service Medal). Issued to all persons in the Naval Service between 6 April 1917 and 11 November 1918, or who entered the Naval Service on or after 12 November 1918 and prior to 30 March 1920, and served not less than 10 days on shore in northern Russia or Siberia or who were attached to one of the following vessels: *Albany*, *Brooklyn*, *Des Moines*, *Eagle No. 1*, *Eagle No. 2*, *Eagle No. 3*, *New Orleans*, *Sacramento*, *South Dakota* or *Yankton*. For details on service clasps, bronze stars, and list of vessels see Sect. 44, NavPers 15790.

Army of Occupation of Germany Medal (1918-23). Issued to officers, Army nurses, warrant officers, and enlisted men of the Armed Forces (or to nearest of kin surviving) who served in Germany or Austria-Hungary during the period of occupation at any time from 12 November 1918 to 11 July 1923. Does not include naval personnel aboard vessels in port, unless detached for duty ashore by competent authority.

Haitian Campaign Medal (1919-20). Issued to officers and men of Navy and Marine Corps who participated in operations in Haiti from 1 April 1919 to 15 June 1920; also the officers and men attached to the vessels listed in Sect. 42, NavPers 15790, between the dates designated.

Second Nicaraguan Campaign Medal. Issued to officers and men of Navy and Marine Corps who served on shore in Nicaragua between 27 August 1926 and 2 January 1933, and to those who were attached to and serving on board the vessels listed in Sect. 45, NavPers 15790, between the dates designated.

Yangtze Service Medal. Issued to officers and men of Navy and Marine Corps who served on shore at Shanghai or in the valley of the Yangtze River in a landing force during the periods between 3 September 1926 and 21 October 1927, and from 1 March 1930 to 31 December 1932; also to those attached to the vessels listed in Sect. 46, NavPers 15790, between the dates designated.

China Service Medal. Issued to officers and men of Navy and Marine Corps who participated in operations in China from 7 July 1937 to 7 September 1939 and from 2 September 1945 to an indefinite date, and to those serving on board vessels listed in Sect. 47, NavPers 15790.

American Defense Service Medal. Issued to all persons in the Naval Service who served on active duty between 8 September 1939 and 7 December 1941, both dates inclusive. For further details as to eligibility, and wearing of clasp, star and bronze "A," see page 562, and Sect. 48, NavPers 15790.

Area Campaign Medals (American, European-African-Middle Eastern, Asiatic-Pacific). Awarded to members of the land and naval forces of the United States (including Women's Reserve) who, between 7 December 1941, inclusive, and a date six months after termination of the war, shall have served outside the continental limits of the United States in the area designated for a period of 30 days (must be consecutive if applied to temporary additional duty). See Sect. 49, NavPers 15790.

World War II Victory Medal. The World War II Victory Medal may be awarded to all members of the Armed Forces of the United States or of the Government of the Philippine Islands who served on active duty in World War II at any time between 7 December 1941 and 31 December 1946, both dates inclusive. (Established by Public Law #135 of 6 July 1945.)

Navy Occupation Service Medal. The Navy Occupation Service Medal is authorized to commemorate the services performed by personnel of the Navy, Marine Corps, and Coast Guard who participated in the occupation of the territories of the enemies of the United States during World War II and subsequent to the surrender of those enemies, and who fulfilled the requirements of eligibility hereinafter set forth. The Secretary of the Navy may tender this medal to personnel of the Army or other components of the Armed Forces of the United States for services which he may determine to be commensurate and consistent with the services for which the award is made to personnel in the Naval Service. For regulations and list of ships and units eligible see Sect. 51, NavPers 15790.

Miscellaneous Medals. *Bailey Medal.* Instituted by the late Rear Admiral Theodorus Bailey for the purpose of inciting apprentices of the Navy to greater effort in acquiring proficiency in their duties.

Naval Reserve Medal. May be awarded by the Chief of Naval Personnel to any officer or enlisted man of the Naval Reserve who has completed 10 years' honorable service in the Naval Reserve, Naval Reserve Force, National Naval Volunteers, or federally recognized Naval Militia in an active-duty or inactive-duty status (bronze star for each additional 10 years). In time of war or national emergency, members of Naval Reserve do not become eligible until they report for active duty. (*Bureau of Naval Personnel Manual*, Art. C-8123.)

Medal for Merit. May be awarded by the President to such civilians of the United Nations and other friendly foreign nations who have, since 8 September 1939, distinguished themselves by exceptionally meritorious conduct in performing outstanding services in furtherance of the war effort. (Act of 20 July 1942.)

Small-arms Medals, Badges. *Navy Distinguished*

Marksman Gold Badge. Awarded to individuals who have won three medals in either or both of the national rifle matches, or who won two medals in the national rifle matches and a place medal in either force or fleet rifle match.

Navy Distinguished Pistol Shot Gold Badge. Awarded for similar accomplishments as above in equivalent pistol matches.

Navy Expert Rifleman Medal. Awarded for attaining qualifications as expert with either the rifle or carbine in prescribed courses.

Navy Expert Pistol Shot Medal. Awarded for attaining qualification as expert with .45-caliber pistol or .38-caliber revolver in prescribed courses.

Marine Corps Awards.[1] *U. S. Marine Corps Brevet Medal.* Awarded to the holder of a commission issued by the President and confirmed by the Senate for distinguished service in the presence of an enemy, in the Mexican War, Civil War, Spanish-American War, Philippine Insurrection and the Boxer hostilities of 1900.

Marine Corps Good-Conduct Medal. May be awarded to a man discharged upon expiration of first enlistment with final average of 4.6 or over in obedience and sobriety, and 4.0 or over in military efficiency, neatness and military bearing and intelligence. For subsequent enlistments, marks must be 4.8 and 4.0, respectively. (Marine Corps enlisted grades are based on 5.0 top rather than on 4.0 as used in the Navy.)

Marine Corps Reserve Service Medal. To be eligible, one must attend with an organized unit of Reserves a 14-day annual field-training period each year for four consecutive years; must attend at least 38 drills yearly for four consecutive years, and in the case of officers, must have received no unsatisfactory fitness reports, or, in the case of enlisted men, must be awarded a final average service record marking of 4.5 or over upon discharge.

Coast Guard Awards.[1] The three medals worn only by Coast Guard personnel—the good-conduct, rifle shot, and pistol shot medals—are awarded on exactly the same basis to Coast Guard personnel as their equivalent medals are awarded to personnel of the United States Navy and Naval Reserve.

Campaign Areas. The areas for which area campaign medals are awarded, and their geographical definitions, are as follows:

American Area. East boundary: From the North Pole, south along the 75th meridian west longitude to the 77th parallel north latitude, thence southeast through Davis Strait to the intersection of the 40th parallel north latitude and the 35th meridian west longitude, thence south along that meridian to the 10th parallel north latitude, thence southeast to the intersection of the equator and the 20th meridian west longitude, thence along the 20th meridian west longitude to the South Pole.

West boundary: From the North Pole, south along the 141st meridian west longitude to the east boundary of Alaska, thence south and southeast along the Alaskan boundary to the Pacific Ocean, then south along the 130th meridian to its intersection with the 30th parallel north latitude, thence southeast to the intersection of the equator and the 100th meridian west longitude, thence south along the 100th meridian west longitude to the South Pole.

European-African-Middle Eastern Area. East boundary: From the North Pole, south along the 60th meridian east longitude to its intersection with the eastern border of Iran, thence south along that border to the Gulf of Oman and the intersection of the 60th meridian east longitude, thence south along the 60th meridian east longitude to the South Pole.

West boundary: Coincident with the east boundary of the American area.

Asiatic-Pacific Area. East boundary: Coincident with the west boundary of the American area.

West boundary: Coincident with the east boundary of the European-African-Middle Eastern area.

Area campaign medals are authorized under any one of the following conditions:

1. Sea duty. Attached to and serving on board a Navy or Coast Guard vessel, or any other to which regularly assigned, in the designated area, or as a member of an organization being transported for duty in an area aboard such vessels, for a period of 30 days. Service need not be continuous nor in same vessel.

2. Shore duty. Attached to and regularly serving on shore in a designated area for a period of 30 days. Such service need not be continuous nor in the same locality, but must be within the designated area.

3. Any combination of (1) and (2) that will aggregate 30 days in a designated area.

4. Patrols. Service in patrol vessels or aircraft operating in or above ocean waters, provided the individual has been attached to such units for a period of 30 days and has performed regularly required patrols. Provision is applicable even if base from which such vessels or aircraft operate is within continental limits.

5. Combat. In all cases where a vessel, aircraft, or other unit engages in combat with, attacks, or is attacked by enemy forces, all personnel serving in that vessel, aircraft, or other unit immediately become eligible for the appropriate area medal without reference

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[1] In addition to Navy awards.

to the 30-day provision. However, the certain presence of enemy forces must be established.

6. Hazardous duty. Engaging in any service in a designated area which, in the opinion of the appropriate fleet or frontier commander or Commandant, United States Marine Corps, is equally as hazardous as combat duty renders the individuals concerned immediately eligible for the appropriate area medal without reference to any time limitation. This applies to such operations as mine recovery and disposal, bomb disposal, or equally hazardous operations.

7. Passengers. No individual en route in a purely passenger status becomes eligible for any area medal unless he or the means of conveyance is attacked by or engages in combat with the enemy, in which case he immediately becomes eligible. Patients in a hospital ship are considered as attached to the ship

8. Temporary or temporary additional duty. No person on such duty is eligible unless it includes a period of at least 30 days consecutive duty in a designated area or unless he engages in combat with or is subjected to attack by enemy forces.

9. In any case, service which entitled an individual to a clasp or star as defined in existing orders also entitles him to the ribbon of the area in which the service is rendered.

"Outside continental limits of the United States" means more than three miles offshore. Coastal duty inside that area would not be considered outside continental limits. For the purposes of these medals, Alaska is considered as outside continental limits.

Pending issue of the medals (after the war), service ribbons are authorized to be worn in lieu of them. For participation in certain operations or engagements, a bronze star is worn. A silver star is worn on the ribbon in lieu of each five bronze stars.

OFFICERS' OFFICIAL RECORDS

Importance

Any matter that is rightfully placed in an officer's official record can never be removed except by special authorization of the Secretary of the Navy. Each day of his service career, the officer is accumulating material which, when properly entered in the records, is there to stay. These records are scanned almost always when any change affecting him is under consideration, such as assignment to duty, special details, examination for promotion, in the event of a general court-martial, disciplinary action by BuPers and—of particular importance—in the selection for promotion to a higher rank. In other words, the officer furnishing the material for his record is daily adding to the evidence that is the basis of his personal and professional reputation in the Navy.

The importance of these records is brought to the particular attention of junior officers, and especially those who have but recently been commissioned. Upon graduation from an officers' training school, these officers are, in a day, removed from the routine of a school that exacts a strict attention to duty from them and exercises a guiding influence in all their affairs. Under these conditions, and frequently accentuated by the youth of the individuals, it sometimes happens that junior officers, without any intention of being lax in the discharge of their responsibilities or in their conduct, and without a full realization of the consequences, either do not put forth their best efforts or fail in the strict observance of the naval code. A mass of unfavorable matter, even though the separate entries are not in themselves of a grave nature, will, in the aggregate, naturally build up a prejudice against an officer which, in effect, might be as detrimental to him in the years to come as a conviction by a general court-martial.

Fitness Report

The fitness report is discussed fully in the next section. Briefly, Regular Navy officers' fitness report jackets include fitness reports, letters of reprimand or censure, and answers to unsatisfactory or unfavorable remarks on fitness reports. Commendations and participation-in-action letters are also part of the Selection Board jacket for officers of the Regular Navy.

Naval Reserve officers' fitness report jackets include fitness reports, answers to unsatisfactory and unfavorable remarks in fitness reports, all letters of performance, commendation, reprimand, censure, and so forth.

Administrative Correspondence File

The administrative correspondence file contains all correspondence of a general administrative and non-confidential nature, such as officer order memoranda, copies of orders, reports of leave, beneficiary slips, home addresses, and miscellaneous material not needed for evaluation of performance. Correspondence files for all officers are kept in the Bureau of Naval Personnel.

Confidential File

The confidential file contains correspondence from any source of a confidential nature pertaining to the officer. It is available for reference only on the authority of the Chief of Naval Personnel in each case. In the majority of cases there is no confidential matter pertaining to the officer, and consequently no confidential file. Matter of an unfavorable nature is first referred to the officer concerned before filing. Confidential files are stored in the Bureau of Naval Personnel.

Examinations

In times of peace the written professional examinations for promotion in rank of officers of the Regular Navy are retained in the examination file. Examination papers are available for the officer's inspection at the Office of the Judge Advocate General.

Records of Proceedings

Records of proceedings, such as courts-martial, inquiries, and investigations, are retained in the Office of the Judge Advocate General and may be inspected by officer concerned.

Report of Beneficiaries

The beneficiary slip lists all beneficiaries of the officer. (The same form is used for enlisted personnel.) Also included in the new form is the report on dependents and the report of next of kin. It is kept in the officer's administrative correspondence file.

Special Selection Board File

The Special Selection Board file is kept only for Regular Navy officers. Included in this file are the following:

1. Extracts from the findings and recommendations of courts and boards concerning the officer. These include statements of disciplinary action and promulgating letters of general courts martial. Complete records of proceedings of courts-martial, inquiries, investigations, and so on, are filed in the Office of the Judge Advocate General.
2. Copies of citations, awards, and letters of commendation or censure.
3. Statements of the officer in reply to adverse matter in his selection board jacket.
4. Certificates: Birth, citizenship, education, and training. Commissions, appointments, acceptances, waivers, oaths of office, and classification changes.
5. Reports of physical examination, medical surveys, personal biographies, transcripts of service, applications for commission, notices of separation, and requests for change of duty.
6. Letters attached to and officially submitted as a part of fitness reports.
7. Written communications from the officer concerned inviting the attention of the selection board to matters of record.

Access to Records

Access to the record of an officer is given only to the officer personally, to the clerk of a court of competent jurisdiction in response to a valid order from that court, to the officers of the Navy Department for use in the transaction of official business, and to the representative of the officer upon presentation by such person of a written authorization from the officer concerned.

With the exception of his confidential file, any officer can obtain access to any of his records by applying to the section in which it is filed in the Navy Department. Only the Chief of Naval Personnel (or Acting Chief of Naval Personnel) has authority to grant access to an officer's confidential file. In case an officer desires that access to his confidential file be given to his representative, the written authorization must state that fact.

Anonymous communications are never made a part of an officer's records.

Keeping a Personal File

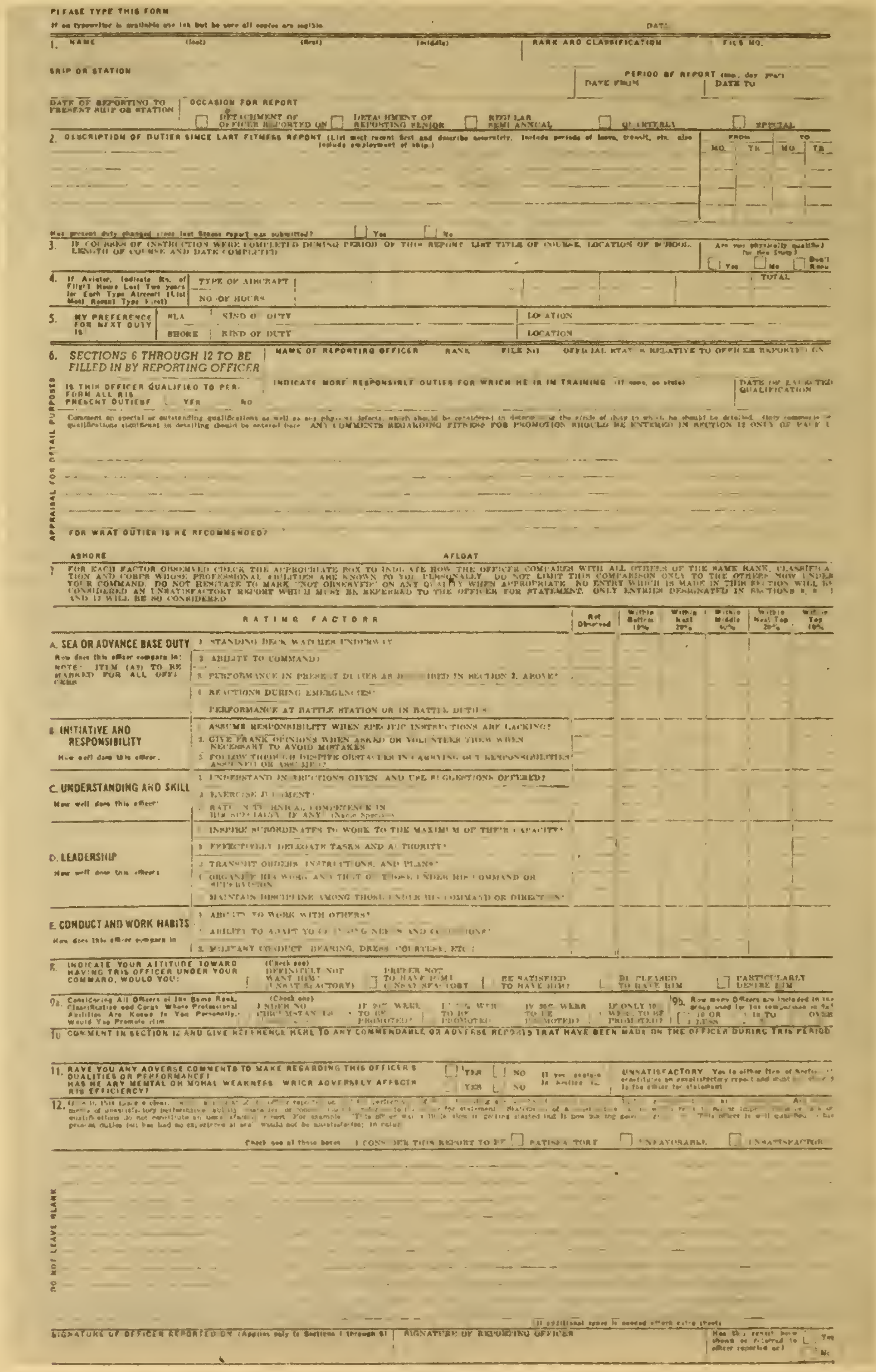
Officers should keep a file of their personal records. It should be started with the first correspondence relating to the officer's naval career. Not infrequently he will find this file of inestimable value in establishing important facts and figures at a later date.

OFFICER'S FITNESS REPORT

General Information

The officer's fitness report (NavPers 310A, Rev. 6-45) serves as a report of fitness for all officers both afloat and ashore. All fitness reports should contain *full* name and file number of the officer being reported on. Initials should not be used. If possible, a typewriter should be used in filling out sections 1 through 6. The remarks and comments entered on the fitness report should cover only the period of time stated in the report.

Besides a page of instructions with a work sheet on the back, the form has three pages. Page 1 is the



PLEASE TYPE THIS FORM

If no typewriter is available use ink but be sure all copies are legible

DATE

1. NAME (last) (first) (middle) | RANK AND CLASSIFICATION | FILE NO.

SHIP OR STATION

PERIOD OF REPORT (mo., day, year) DATE FROM | DATE TO

DATE OF REPORTING TO PRESENT SHIP OR STATION | OCCASION FOR REPORT

☐ DETACHMENT OF OFFICER REPORTED ON ☐ DETACHMENT OF REPORTING SENIOR ☐ REGULAR SEMI ANNUAL ☐ QUARTERLY ☐ SPECIAL

2. DESCRIPTION OF DUTIES SINCE LAST FITNESS REPORT (List most recent first and describe accurately. Include periods of leave, transit, etc. also include employment of ship.)

	FROM		TO	
	MO.	YR.	MO.	YR.

Has present duty changed since last fitness report was submitted? ☐ Yes ☐ No

3. IF COURSES OF INSTRUCTION WERE COMPLETED DURING PERIOD OF THIS REPORT LIST TITLE OF COURSE, LOCATION OF SCHOOL, LENGTH OF COURSE AND DATE COMPLETED | Are you physically qualified for Sea Duty? ☐ Yes ☐ No ☐ Don't Know

4. If Aviator, Indicate No. of Flight Hours Last Two years for Each Type Aircraft (List Most Recent Type First) | TYPE OF AIRCRAFT | NO. OF HOURS | TOTAL

5. MY PREFERENCE FOR NEXT DUTY IS | SEA | KIND OF DUTY | LOCATION | SHORE | KIND OF DUTY | LOCATION

6. *SECTIONS 6 THROUGH 12 TO BE FILLED IN BY REPORTING OFFICER* | NAME OF REPORTING OFFICER | RANK | FILE NO. | OFFICIAL STATUS RELATIVE TO OFFICER REPORTED ON

APPRAISAL FOR DETAIL PURPOSES

IS THIS OFFICER QUALIFIED TO PERFORM ALL HIS PRESENT DUTIES? ☐ YES ☐ NO | INDICATE MORE RESPONSIBLE DUTIES FOR WHICH HE IS IN TRAINING (If none, so state) | DATE OF EXPECTED QUALIFICATION

Comment on special or outstanding qualifications as well as any physical defects, which should be considered in determining the kinds of duty to which he should be detailed. (Any comments on qualifications significant in detailing should be entered here. ANY COMMENTS REGARDING FITNESS FOR PROMOTION SHOULD BE ENTERED IN SECTION 12 ONLY OF PAGE 1.

FOR WHAT DUTIES IS HE RECOMMENDED?

ASHORE AFLOAT

7. FOR EACH FACTOR OBSERVED CHECK THE APPROPRIATE BOX TO INDICATE HOW THE OFFICER COMPARES WITH ALL OTHERS OF THE SAME RANK, CLASSIFICATION AND CORPS WHOSE PROFESSIONAL ABILITIES ARE KNOWN TO YOU PERSONALLY. DO NOT LIMIT THIS COMPARISON ONLY TO THE OTHERS NOW UNDER YOUR COMMAND. DO NOT HESITATE TO MARK "NOT OBSERVED" ON ANY QUALITY WHEN APPROPRIATE. NO ENTRY WHICH IS MADE IN THIS SECTION WILL BE CONSIDERED AN UNSATISFACTORY REPORT WHICH MUST BE REFERRED TO THE OFFICER FOR STATEMENT. ONLY ENTRIES DESIGNATED IN SECTIONS 8, 9, 11 AND 12 WILL BE SO CONSIDERED.

	RATING FACTORS	Not Observed	Within Bottom 10%	Within Next 20%	Within Middle 40%	Within Next Top 20%	Within Top 10%
A. SEA OR ADVANCE BASE DUTY How does this officer compare in: NOTE: ITEM (A3) TO BE MARKED FOR ALL OFFICERS	1. STANDING DECK WATCHES UNDERWAY?						
	2. ABILITY TO COMMAND?						
	3. PERFORMANCE IN PRESENT DUTIES AS DESCRIBED IN SECTION 2, ABOVE?						
	4. REACTIONS DURING EMERGENCIES?						
	PERFORMANCE AT BATTLE STATION OR IN BATTLE DUTIES						
B. INITIATIVE AND RESPONSIBILITY How well does this officer:	1. ASSUME RESPONSIBILITY WHEN SPECIFIC INSTRUCTIONS ARE LACKING?						
	2. GIVE FRANK OPINIONS WHEN ASKED OR VOLUNTEER THEM WHEN NECESSARY TO AVOID MISTAKES						
	3. FOLLOW THROUGH DESPITE OBSTACLES IN CARRYING OUT RESPONSIBILITIES ASSIGNED OR ASSUMED?						
C. UNDERSTANDING AND SKILL How well does this officer:	1. UNDERSTAND INSTRUCTIONS GIVEN AND USE SUGGESTIONS OFFERED?						
	2. EXERCISE JUDGMENT?						
	3. RATE IN TECHNICAL COMPETENCE IN HIS SPECIALTY, IF ANY? (Name Specialty)						
D. LEADERSHIP How well does this officer:	1. INSPIRE SUBORDINATES TO WORK TO THE MAXIMUM OF THEIR CAPACITY?						
	2. EFFECTIVELY DELEGATE TASKS AND AUTHORITY?						
	3. TRANSMIT ORDERS, INSTRUCTIONS, AND PLANS?						
	4. ORGANIZE HIS WORK AND THAT OF THOSE UNDER HIS COMMAND OR SUPERVISION						
	5. MAINTAIN DISCIPLINE AMONG THOSE UNDER HIS COMMAND OR DIRECTION?						
E. CONDUCT AND WORK HABITS How does this officer compare in:	1. ABILITY TO WORK WITH OTHERS?						
	2. ABILITY TO ADAPT TO CHANGING NEEDS AND CONDITIONS?						
	3. MILITARY CONDUCT, BEARING, DRESS, COURTESY, ETC.?						

8. INDICATE YOUR ATTITUDE TOWARD HAVING THIS OFFICER UNDER YOUR COMMAND, WOULD YOU: (Check one) ☐ DEFINITELY NOT WANT HIM? (UNSATISFACTORY) ☐ PREFER NOT TO HAVE HIM? (UNSATISFACTORY) ☐ BE SATISFIED TO HAVE HIM? ☐ BE PLEASED TO HAVE HIM ☐ PARTICULARLY DESIRE HIM

9a. Considering All Officers of the Same Rank, Classification and Corps Whose Professional Abilities Are Known to You Personally, Would You Promote Him (Check one) ☐ UNDER NO CIRCUMSTANCES ☐ IF 90% WERE TO BE PROMOTED? ☐ IF 70% WERE TO BE PROMOTED ☐ IF 30% WERE TO BE PROMOTED? ☐ IF ONLY 10% WERE TO BE PROMOTED?

9b. How many Officers are included in the group used for the comparison in 9a? ☐ 10 OR LESS ☐ 11 TO [illegible] ☐ OVER [illegible]

10. COMMENT IN SECTION 12 AND GIVE REFERENCE HERE TO ANY COMMENDABLE OR ADVERSE REPORTS THAT HAVE BEEN MADE ON THE OFFICER DURING THIS PERIOD

11. HAVE YOU ANY ADVERSE COMMENTS TO MAKE REGARDING THIS OFFICER'S QUALITIES OR PERFORMANCE? ☐ YES ☐ NO HAS HE ANY MENTAL OR MORAL WEAKNESS WHICH ADVERSELY AFFECTS HIS EFFICIENCY? ☐ YES ☐ NO If yes explain in Section 12. UNSATISFACTORY. Yes in either line of Section 11 constitutes an unsatisfactory report and must be referred to the officer for statement.

12. [illegible] this space a clear [illegible] of the officer reported on [illegible] items of unsatisfactory performance, ability, character or conduct [illegible] referred to the officer for statement. Statements of a [illegible] qualifications do not constitute an unsatisfactory report. For example: "This officer was a little slow in getting started but is now making good [illegible]." "This officer is well qualified for his present duties but has had no experience at sea." Would not be unsatisfactory. In order [illegible]

Check one of these boxes: I CONSIDER THIS REPORT TO BE ☐ SATISFACTORY ☐ UNFAVORABLE ☐ UNSATISFACTORY

DO NOT LEAVE BLANK

If additional space is needed attach extra sheets

SIGNATURE OF OFFICER REPORTED ON (Applies only to Sections 1 through 5) | SIGNATURE OF REPORTING OFFICER | Has this report been shown or referred to officer reported on? ☐ Yes ☐ No

OFFICER'S FITNESS REPORT

fitness report itself. This is kept on file in the Bureau of Naval Personnel in the officer's fitness report jacket. Pages 2 and 3 repeat only the upper part of Page 1 and are arranged so as to be filled in as carbon copies of the original. Page 2, duplicating the first six sections of Page 1, is submitted with the original and serves to keep up to date a separate record in the Bureau of Naval Personnel of the officer's previous experience and qualifications for various types of duty. Page 3, the same as Page 2, except that it omits the blanks for "appraisal for detail purposes," is placed in the officer's qualification record jacket. Each officer below the rank of captain carries such a jacket with him on any permanent change of duty station as a guide to his new commanding officer or personnel officer in assigning him properly.

Preparation of Fitness Reports

The preparation of fitness reports is one of the most important and responsible duties of an officer and should not be entered upon lightly. In the present war, many officers of junior rank have had this grave responsibility. Careful consideration should be given to each officer by the reporting officer and by officers who submit rough reports to a commanding officer for consideration.

Fitness reports are submitted in accordance with requirements in *Navy Regulations*, *Bureau of Naval Personnel Manual*, and the current Bureau of Naval Personnel Circular Letter on the subject of fitness reports.

Reporting seniors should submit reports promptly. Failure to do so is prejudicial to the rights of the officer reported on and is not to be tolerated by the Bureau of Naval Personnel.

The commanding officer of a ship should require the executive officer to report to him on the fitness of all heads of departments and other officers attached to the ship, and should, in addition, require the heads of ship departments to report to him on the fitness of officers who have performed duty under their orders. These reports rendered to the commanding officer by the executive officer and heads of departments are for his use in making his report on the fitness of all officers under his command and are not forwarded to the Navy Department unless, in unusual cases, the commanding officer deems such procedure advisable, in which event he should state the reason therefor.

The first five sections of the officer's fitness report are filled out by the officer reported on, the remainder by the reporting officer. It should be noted that in section 7 and subsequent sections, the reporting officer is asked to compare each officer reported on with *all others* of the same rank, and approximately the same length of service in that rank, whose professional abilities are known to him personally. This means, of course, that the officer being reported on is not to be compared *only* with the others of his rank at the particular time under the reporting officer's command. It is for this reason that it is important to indicate in section 9 how many officers are included in the group the reporting officer is using for comparison. This method of evaluating officers is helpful to Selection Boards or Panels who must, in effect, in deciding on promotions of officers, compare an officer with others of the same rank rather than employ more arbitrary standards. (The older method was to measure officers against the 4.0 arbitrary standard of perfection.)

In making the comparison referred to above, it should be borne in mind that the group of officers whose professional abilities are known to the reporting officer personally will tend to fall into a normal distribution when graded on any quality, trait, characteristic or other factor. There will normally be a small number at the lower end, a larger group in the middle, and a small group at the top. With this curve in mind, the reporting officer compares the officer he is reporting on with the entire group and marks him on each factor in section 7 as falling in one of the five brackets — the lower 10, the next 20, the middle 40, the next 20, or the top 10. The reporting officer should not hesitate to mark "not observed" on any factor which seems not applicable to the duty the officer performed or in situations where the reporting officer's observation has been too limited to warrant judgment.

Only adverse entries in sections 8, 9, 11, and 12 are to be considered an unsatisfactory report. Therefore only adverse entries in these sections need be referred to the officer reported on for statement. A record of all punishments inflicted upon the officer, with the date and nature of offense and the kind and degree of punishment, should be set forth under section 12 of the fitness report. Whenever any portion of the report made by the reporting senior is unsatisfactory, the reason should be clearly stated in section 12 and the entire report referred to the officer reported on for his statement with regard to the unsatisfactory portion. The report and signed statement should be returned without delay to the reporting senior. The reporting senior forwards the statement and fitness report to the Bureau of Naval Personnel by indorsement. If the officer reported upon does not desire to make a statement, he should so state in writing. Reporting seniors are not required to give answers to queries which are beyond their personal knowledge.

Reporting seniors should maintain a separate mail log regarding fitness reports as well as a file of fitness report work sheets.

Before forwarding the report to BuPers, carefully insure that:

a. Every paragraph is complete in detail (*full* names, dates and file numbers are emphasized).

b. Both the reporting senior and subject officer have signed the report in ink.

c. Reporting senior include his file number with his name, rank, and official status.

d. If report of attachments is *unsatisfactory*, a *signed* statement from officer concerned covering *all* such matter is appended.

e. All erasures or deletions have been initialed by the reporting senior.

While the reporting officer is required by *Navy Regulations* to refer only unsatisfactory or unfavorable reports to the officer concerned, it is the opinion of the Bureau of Naval Personnel that fitness reports are of greatest value to officers of the Navy if the reporting officer when possible discusses them with the officer reported on, as a matter of general practice.

Unsatisfactory and Unfavorable Reports

A statement on a fitness report that performance of duty is clearly unsatisfactory constitutes an *unsatisfactory* report. A statement of minor deficiencies either in character or performance of duties constitutes an *unfavorable* report. An unsatisfactory report must have the statement of the officer reported attached; an unfavorable report requires that the officer reported on has been informed of his deficiencies either verbally or in writing. It should be noted that the instructions in section 12 clearly state that remarks of a constructive nature which refer to minor imperfections or lack of qualifications do not constitute an unsatisfactory report. Examples of such statements are:

"This officer was a little slow in getting started but is now making good progress."

"This officer is well qualified in his present duties but has had no experience at sea."

"This officer's most serious fault is lack of service experience, which he is always willing and eager to remedy by seeking information and advice."

Each reporting senior, when referring an unsatisfactory fitness report to the officer reported on, should specifically invite that officer's attention to *Navy Regulations*, article 1701, which deals with the fitness report.

When Submitted

The fitness report is to be submitted semiannually for all officers and in all cases of permanent detachment of either the officer or reporting senior. Special reports are submitted only at the following times:

1. When directed by higher authority.
2. When officer is recommended for trial by general court-martial.
3. Upon receipt of orders for officer to Bureau of Naval Personnel for disciplinary hearing.
4. When requesting detachment of officer (attach to request).
5. Upon recommendation that officer be disenrolled.

How Forwarded

Where there are no attachments classified higher than restricted, fitness reports should be forwarded in double envelopes, but not marked confidential. The outer envelope should be addressed to the Bureau of Naval Personnel and the inner envelope marked "Fitness Report, Private (Official) Communication." This will eliminate forwarding by registered mail and other delays. Letters of transmittal are neither required nor desired. Where there are attachments classified higher than restricted, the report should be transmitted in the same manner as material of the classification of the attachment highest classified. Do not exact classified decodes.

In view of comparatively open classification of officers' reports of fitness, reporting seniors of the Navy, Marine Corps, and Coast Guard, must be especially careful not to include any information which could be of possible value to an enemy. Entries, comments, or remarks which, if reports were considered singly or as a group, would disclose information regarding composition, location, or mission of a unit, nature and condition of equipment, armament, and the like, should be scrupulously avoided. When necessary or desirable to include comments in which classified information is directly pertinent, such comments will be forwarded by separate classified letter.

All reports of fitness should be considered as private (official) communications between the Chief of Naval Personnel (or the Commandant of the Marine Corps as the case may be), the reporting senior, and the officer reported on. In the event of their being referred to an officer for comment or other purpose, they should be sent privately (officially) to such officer and should be similarly returned direct, unless they call into question the action of any higher authority, in which case they should be forwarded in the same private (official) manner via such higher authority.

Special Reports in Letter Form

Special reports, in letter form, are made at any time that occasion may arise of:

1. Distinguished conduct in battle.
2. Conspicuous acts of valor or devotion in line of duty.
3. Extraordinary courage, ability, or resourcefulness in time of peril or great responsibility.

(These provisions should be strictly construed and not extended to cover acts of duty that, although out of the ordinary course, are yet not uncommon in seafaring or military life. The regular reports of fitness should comprise as complete an estimate as practicable of an officer's performance of duty, special and ordinary, during the period in question.)

4. Serious misconduct or marked inefficiency. (A copy is to be referred to the officer concerned for such statement as he may choose to make in reply.)

5. Temporary detachment or absence of officers from regular stations, on duty out of or additional to regular course. (Such officers are reported on by the senior under whom the special or additional duty is performed. The report, in letter form, is sent to the officer's regular reporting senior for his information and is appended to the next regular report of fitness. This paragraph does not apply to duty on courts, boards, surveys, etc.)

What the Fitness Report Means to Officers

The fitness of an officer for the service, with respect to promotion and assignment for duty, is determined by his record. Reports on fitness and special reports are decisive on the service career of the individual officer, and have important influence on the efficiency of the entire Navy.

The fitness report places major emphasis upon personal attributes, rather than upon professional attainments. These reports should constitute an accurate evaluation of the officer's merits and demerits. Basically they represent the well-considered opinion of one senior as to the performance of duty during a specific period of one of his subordinates. It is a most unfortunate sign if the same weaknesses are commented upon in the report time after time. After an officer investigates his fitness report he should take immediate steps to correct his deficiencies. An officer should avoid the feeling of resentment against the reporting officer if he has not been reported upon as favorably as he feels he deserves. It is well to learn about oneself by looking through the reporting officer's eyes.

It is wise for an officer not to worry about his fitness report, but to do each job given him to the best of his ability. Under such circumstances the fitness reports usually take care of themselves.

With the years, a collection of fitness reports accumulates in the officer's file in the Bureau of Naval Personnel. They are made by a number of senior officers who are assumed to be impersonal in their evaluation and have the best interests of the Navy at heart. Taken together, these reports give a running record of an officer's performance of duty under varying conditions and are of inestimable value for the Selection Board when convened to consider officers for promotion. The detail officer in BuPers also finds them of great value in assigning the officer to duty which he is best equipped to perform.

OFFICER DESIGNATORS, QUALIFICATION, AND SELECTION

Officer Designator Symbols

The Navy maintains an extensive system of personnel processing and records in order to insure that the duty assignments of officers relate, in so far as conditions permit, to their educational, civilian, and naval background. One basic control used to further this objective is the assignment of a designator symbol to each Naval Reserve officer.

These symbols separate officers into the general fields of their usefulness to the Navy. For example, the symbol 1100 describes officers of the line who are available for line duties ashore or afloat without regard to their specialized or particular qualifications. The symbol 1150 describes officers of the line who are available for shore duty only by reason of peculiar qualifications, age, physical disqualification for sea duty, or whose rank, age, and previous sea experience are incompatible with duty afloat. Other symbols describe the various staff corps (MC, DC, MSC, NC, SC, CEC) and types of aviation personnel. These designators are not to be interpreted as being descriptive of the qualifications of individuals but rather as a means of indentification of general areas of employment. Designators are permanent unless changed by action on the part of the Bureau of Naval Personnel. Changes of designator may be requested by individuals or by commanding officers but are limited to those cases of actual changes of status.

Coding of Officer Qualifications

A second basic control designed to insure effective utilization of officer skills is the analysis and recording of all important qualifications of naval officers and the use of such records in filling each billet with an officer qualified to perform the duties of such billet.

Information on each officer's qualifications is obtained by having each officer, each warrant officer, and each prospective officer in training submit an Officer Qualification Questionnaire Form, NavPers 309, to the Bureau of Naval Personnel. This form is filled out in duplicate and submitted at least once during an officer's career. The qualifications contained in this form include naval duties performed, civilian occupational experience, degree achieved and major subjects in education, linguistic ability, areas of foreign travel, and naval schools attended. This information is translated into numerical codes and processed into cards for use in accounting machines. When placed in properly organized files, the cards and questionnaires for each officer become an inventory of skills, experience, and abilities which is easily consulted to select an officer with the necessary qualification or combination of qualifications to fill a specific billet.

As officers proceed through a career in the Navy or in civilian life their qualifications change with passing time. To keep abreast of these changes, the new qualifications achieved are submitted to the Bureau of Naval Personnel in two forms. The first form for those on active duty is the tear-off sheet of the fitness report, Form NavPers 310B. These forms are coded to reflect new and/or additional qualifications. The second form used is the Annual Qualifications Questionnaire, Form NavPers 319. This form, submitted annually by each officer on inactive duty, supplants the fitness report tear off sheet. In NavPers 319 each officer reports his present address, home of record and changes in his education, civilian employment, linguistic ability, foreign travel, hobbies, writings, publications produced, and other matters which bear on an individual's usefulness to the Navy in time of war. This information is used to correct annually the qualification codes assigned previously and keeps the Navy up to date on the total potential of the Naval Reserve.

Copies of these qualification cards are maintained in the naval district of residence of each Reserve officer and they form a basis for decentralized detailing of officers in the event of mobilization.

The Billet Interview

A third basic program used to promote effective use of naval officers is the program of officer billet selection. Interviewing officers function in the field — in time of peace at Naval Reserve Officer Training Corps units and in time of war at NROTC units, primary training schools, indoctrination schools, precommissioning and operational training centers and at advanced base pools—to test and interview officers for the purpose of recommending their further assignment to significant duty. In this manner the Bureau of Naval Personnel manages to meet the great number of junior officers face to face. The interviewing officers describe the types of duty available to young officers, lecture on the opportunities available in various types of billets, and distribute materials on the types of duty performed in the Navy. Further, they study each officer's background, administer general and special Navy tests, and conduct a personal interview with each officer to be assigned. The results of each such interview are presented to the Bureau of Naval Personnel as a recommendation for the appropriate next duty assignment. A record of the grades received in each school and in each test administered is entered in the Training School Report, Form NavPers 318. The original of this form is forwarded to the Bureau of Naval Personel for inclusion in the qualification record, and a copy is entered in the officer's qualification record jacket.

Officer Qualifications Record Jacket

The qualifications record jacket, NavPers 305, serves as a permanent record of the naval experience of each individual. It includes a copy of the Officer Qualification Questionnaire, all Training School Reports, and tear-off sheets of each fitness report, Form NavPers 310C. While on active duty this jacket is carried by its owner from station to station and is maintained by the personnel officer of the station to which attached. It is used as a guide to duty assignment by the commanding officer and contains a concise story of an individual's experiences and background which could be duplicated only through a lengthy interview at each successive stage of assignment.

Officer Distribution Branch

The activities herein described are under the cognizance of the Officer Distribution Branch of the Officer Personnel Division, Bureau of Naval Personnel. This branch includes the rank desks which originate the type of duty assignment for each officer, the program detail desks which determine the ship or station-assignment with the type for each officer, a service unit which prepares the orders in final form and delivers them, and an inactive officers' section which handles the detail of Reserve officers to organized units and other Reserve matters.

This great effort to obtain maximum use of officer skills has helped make the Navy an efficient, hard-hitting force. It has placed officers with valuable abilities in billets where their abilities have been of immediate and effective service to the Navy because of the minimum preparation required for maximum effectiveness. In a war of the future, it is not inconceivable that every billet from the very begining will be filled by an officer who already possesses the required qualifications for successful performance of the duties demanded and that the efficiency of the Navy at war will be maintained at a level never heretofore obtained by any war-waging organization.

ENLISTED SERVICE RECORD

General Information

For every person enlisting in the Navy a service record is started immediately. This record accompanies the enlistee to all duty stations and is kept by his commanding officer.

When the enlistment is completed, the service record is closed out and forwarded to the Bureau of Naval Personnel.

To keep a duplicate record of service the Bureau of Naval Personnel maintains a jacket for each enlistee. The shipping articles and certain duplicate pages of the service record, submitted to the bureau from time to time, are kept in this jacket. From it the bureau is able to maintain a duplicate service record should the original be lost. A new service record is opened for each enlistment.

Every officer should be familiar with the forms involved and with all information required and action taken. The most important facts with which an officer need be concerned are as follows: that a record, based on the quarterly marks card, is kept on a man's conduct and proficiency; that certain information is entered in the record when a man is transferred to another ship or station; that all details of disciplinary or commendatory action are recorded; that any completed training courses or successfully passed examinations for advancement are entered; that all orders to disbursing officers involving a change in pay status are entered.

Pages of the Service Record

The first document incident to an enlistment is the shipping articles. This item is sent to the Bureau of Naval Personnel and an abstract of it is retained for the service record on pages 1 and 2. The individual's full name, service number, and branch of service (Regular Navy or Naval Reserve, with Class), amount of previous service, if any, and continuous service certificate number, if any, are given on the face of the record. The remainder of the record is made up of a number of pages containing information as follows:

Pages 1 and 2 contain personal data and an abstract of the shipping articles. Two copies are furnished the disbursing officer as the Order to Enter Account.

Pages 3 and 4 contain identification records and a description list, including fingerprints. These are filled out upon enlistment and reenlistment. (No copy is sent to the Bureau of Naval Personnel.)

Pages 5 and 6 contain data regarding absence from duty — page 5, authorized leave and page 6, unauthorized absence from duty. They are filled out as occurring. (No copy is sent to BuPers.)

Pages 7 and 8 are the beneficiary slip, giving the man's full name, service number, present duty station, and the name and address of his beneficiary or beneficiaries. Article B-2318, *Bureau of Naval Personnel Manual,* governs the submission of these pages to BuPers.

Page 8A, filled out for Naval Reservists only, is the drill page and contains numbers of days of active duty in a drill status, ship or station, and marks attained.

Page 9 is the backbone of the service record. On the service record page 9's will be found two kinds of records: on the regular page 9 is entered a chronological record of service during enlistment; and on a series of special page 9's (followed by a letter as 9T, 9U, etc.) is entered a record of changes in pay status. Attention is invited to the *Bureau of Naval Personnel Manual,* Articles B-2320 to 2328, for full information regarding entries to be made thereon.

At the top of a regular page 9 is shown the man's full name, service number, present rate and date received aboard present ship or station. The remainder of the page is for the chronological record of important events occurring in the enlistee's service and not provided for elsewhere in the record: commendatory and disciplinary action, special training, completion of training courses, application for insurance, authority for transfer, etc.

Page 9Y is prepared for all enlisted personnel upon transfer. It contains the man's full name, rate, service number, and indicates ultimate destination and intermediate reporting points, if any. It also gives authority for transfer, nature of assignment, records in possession of the man transferred and marks in proficiency and conduct upon transfer. This page is prepared in duplicate, signed by the commanding officer, and is placed after the last page 9 of the service record. The ship or station at which the man is received fills in the date the man is received and places the original in the service record and forwards the duplicate copy to the Bureau of Naval Personnel.

Marks in proficiency and in conduct are entered on pages 9 and 9Y. Page 5A-5B is the Quarterly Marks Page. Marks are recorded quarterly and no copy is forwarded to BuPers.

When changes occur in pay status, it is necessary to enter all relevant data in the service record and furnish the disbursing officer an appropriate order. Record of these changes is accomplished by use of the special pages (9T, 9U, 9V, 9W, and 9X) which are prepared with interleafed "snap out" carbons. Each page has a corresponding NavSandA number:

519, 518, 517, 516, and 515, respectively. A new form is required for each change.

Page 9T, Form NavSandA 519, is a record of misconduct and is filled out in quadruplicate, one for the service record, two for the disbursing officer, and one for the medical officer.

Page 9U, Form NavSandA 518, is an individual order to adjust the pay account for absence or sentence of court, or both. One copy is for the service record, one goes to the Bureau of Naval Personnel, and two are for the disbursing officer.

Page 9V, Form NavSandA 517, is the individual order to adjust pay account for quarters or subsistence allowance or commuted rations. One copy goes into the service record and two to the disbursing officer.

Page 9W, Form NavSandA 516, covers the individual order to adjust the pay account for extra pay service. One copy is for the service record and two for the disbursing officer.

Page 9X, Form NavSandA 515, covers a change in rating, or Reserve Class, or a change in longevity for pay purposes. One copy is for the service record, two for the Bureau of Naval Personnel, and two for the disbursing officer.

When an honorable discharge button is issued, notation of the issue will be made on page 9 of the service record of the recipient over his or her signature.

When a man desires to extend his enlistment, Form NavPers 604 (NavSandA 513) is provided. The agreement to extend must be made prior to the expiration of the enlistment. The partially completed form (the agreement part) is placed in the back of the record and a copy sent to the Bureau of Naval Personnel. When the enlistment would have normally expired, the form is completed, effecting the extension. The original is then sent to the Bureau of Naval Personnel. Two copies are furnished the disbursing officer, and one copy is placed in the service record as a page 9 and will serve as a mark between that service recorded for the original enlistment and that recorded for the extension.

Pages 11 and 12, Form NavSandA 512, are the closing-out pages. These are filled out upon cancellation of enlistment, discharge, desertion, death, retirement, or transfer to the Fleet Reserve. The commanding officer of the ship or station from which the man is discharged is responsible for the complete filling out of page 12. The original is sent to the Bureau of Naval Personnel in the closed service record. Copies are furnished the disbursing officer as the Order to Close Account.

Page 11a, Form NavSandA 514, is an account of sale of deserter's effects and order to transfer the deserter's account to the Desertion Rolls, Bureau of Supplies and Accounts. It supplements pages 11-12 in closing the record of a deserter. A copy is placed in the record and two copies are furnished the disbursing officer.

When a man attains a special qualification in gunnery, a special service record two-page form is made out and inserted in the record. The first page is called the *gunnery record* and the second the *aviation gunnery record.* (Usually it is placed in the record preceding the page 9-10's. No copy is sent to the Bureau of Naval Personnel.)

Many miscellaneous papers and correspondence are kept in the pocket on the inside front cover of the service record and/or in the jacket filed in the Bureau of Naval Personnel. These include such items as the following: induction papers, if the man is an inductee (IND) or a selective volunteer (SV); application for enlistment papers, if the man enlisted voluntarily; consent papers, if the man is a minor; reports of examination for advancement or change in rating (Form NavPers 624); letters written concerning the man; copies of various orders issued the man (change of station, detached duty, etc.); birth certificates; transcripts of educational credits; and various other miscellaneous papers and correspondence.

An important adjunct to the enlisted service record is the enlisted classification page (4A and 4B). This page is described in greater detail in the section that follows.

CLASSIFICATION OF ENLISTED PERSONNEL

Officer's Responsibility

A major responsibility of every naval officer is the efficient utilization of the enlisted personnel serving under him. This requires the proper assignment and constant training of each man. Therefore, every officer has an obligation to see that his men are assigned to duties which make the best use of their abilities individually and as a crew, and that the men are constantly given opportunity and stimulation for training to improve their performance in their present duties and to qualify for appropriate billets requiring a higher degree of competence.

In order to discharge this responsibility successfully it is essential that an officer have, in addition to an understanding of the jobs to be performed by the men in his command, adequate knowledge of the qualifications of each man under him — his general level of intelligence and ability, his civilian education and work experience, his Navy training and experience, his physical characteristics, and his interests and personal characteristics. This knowledge is required for the proper initial assignment of the man, for guiding his training, and for qualifying him for advancement in rating, or selecting him for advanced and specialized schools.

Enlisted Classification Record

The classification of enlisted personnel consists of testing for aptitudes and background, personal interview to obtain certain evaluating data and the assignment of Navy Job Classification Codes which identify the naval job skill of each enlisted person in the Regular Navy and Naval Reserve.

The basic record used in the classification program is the Enlisted Classification Record, Page 4A-4B of the enlisted service record. This page has been designed to assemble in a compact convenient form all the permanent personal evaluation data important to an understanding of a man's potentialities and background.

Page 4A contains the following information:

a. Scores attained on the Navy Basic Classification Test Battery.
b. The relative percentage standing of these scores as compared to all other enlisted naval personnel.
c. The appropriate Civilian Occupational Code as determined from the Dictionary of Occupational Titles.
d. Special test scores.
e. Formal educational achievement.
f. Specialized civilian training.
g. Hobbies, sports, talent for public entertainment.
h. Brief physical qualifications.

Page 4B contains:

a. Title of main civilian occupation.
b. Employer's name and location.
c. Years of service in this occupation, weekly wage, trade test if administered, and score.
d. Descriptions of duties, skills and machines as they pertain to main civilian occupation.
e. A similar writeup for the man's second best occupation.
f. Space for recording other work experience.
g. Interviewer's naval occupational or training recommendations.
h. Signatures of interviewee and interviewer and date of preparation.

The page 4A-4B is prepared at a Naval Training Center or Naval Reserve Training Center and its preparation is an integral part of recruit or enlisted Reserve processing procedures. The information it contains is derived from the tests administered and a personal interview between the man and a trained Personnel Man (Classification Interview).

This page accompanies a man throughout his naval career, being transferred from old to new service record on each reenlistment.

The recorded information is used initially at the Naval Training Center for the selection of recruits to be assigned to service schools or to other types of training or duty. It is used later to classify and select pre-commissioning crews, in assignment of men to divisions and billets and for the selection of personnel for schools or special duty.

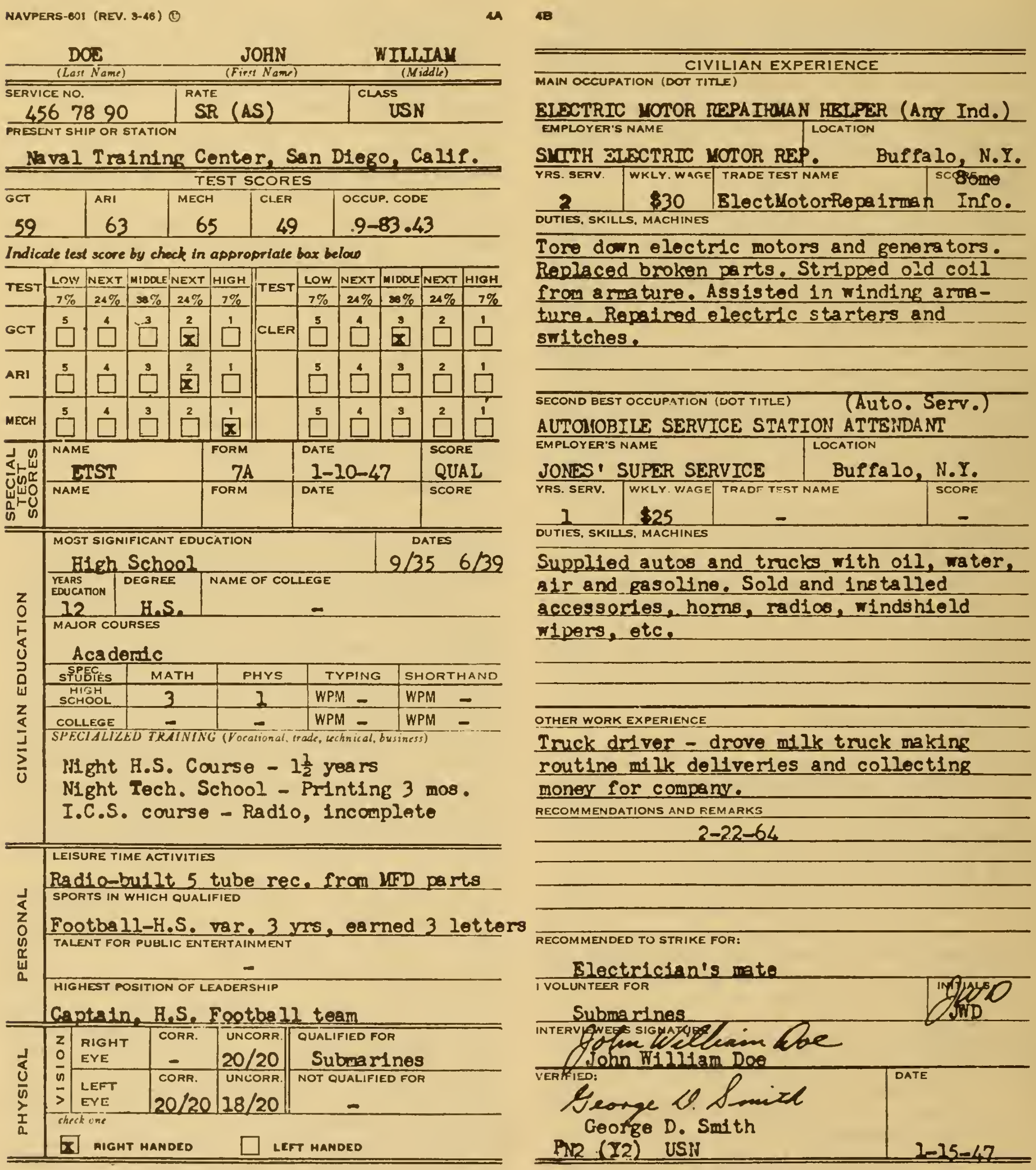
Guidance for interpreting the various specific entries on the page 4A-4B and to the use of other classification data such as the Navy Job Classification Code is provided in a manual entitled *Guide to Enlisted Classification* (NavPers 15780). Copies may be obtained from the Chief of Naval Personnel (Pers-637). Every officer should have a copy of this manual available for convenient reference.

How Page 4A-4B Is Used

Officers will find the information contained on page 4A-4B of the service record of great utility and value on either a ship or shore station. Among the more important standard uses of this page are the following:

1. *Determining Assignments of Non-Petty Officer Personnel.* An officer frequently faces the problem of determining assignments for non-petty officer personnel who have no previous naval experience or training of a specialized nature. It is often necessary to assign such people to striker billets, to select some for operational training, to prescribe training and educational courses for some, to determine which are the most promising petty officer material, and so on. The test score and background data furnished by the page 4A-4B are the best sources of evaluation information necessary to intelligent assignment decisions in these cases.

2. *Determining Assignments For Petty Officers.* The page 4A-4B together with the Navy Job Classification Code is of great value in assigning petty officers to general quarters stations, watch stations and routine duties on board ship and to appropriate shore station billets, including advanced schools. The page 4A-4B provides the test and background data, and the Navy Job Classification Code provides the naval occupational identification information necessary to optimum utilization of petty officer manpower. Experience has demonstrated that there are wide variations in ability, specialization and types of experience among men in the same rate and pay grade. A man's rating designation does not provide sufficient information regarding his particular abilities and experience



NAVPERS-601 (REV. 3-46) © 4A

DOE (Last Name)	JOHN (First Name)	WILLIAM (Middle)
SERVICE NO. 456 78 90	RATE SR (AS)	CLASS USN

PRESENT SHIP OR STATION: Naval Training Center, San Diego, Calif.

TEST SCORES

GCT	ARI	MECH	CLER	OCCUP. CODE
59	63	65	49	9-83.43

Indicate test score by check in appropriate box below

TEST	LOW 7%	NEXT 24%	MIDDLE 38%	NEXT 24%	HIGH 7%	TEST	LOW 7%	NEXT 24%	MIDDLE 38%	NEXT 24%	HIGH 7%
GCT	5 ☐	4 ☐	3 ☐	2 ☒	1 ☐	CLER	5 ☐	4 ☐	3 ☒	2 ☐	1 ☐
ARI	5 ☐	4 ☐	3 ☐	2 ☒	1 ☐		5 ☐	4 ☐	3 ☐	2 ☐	1 ☐
MECH	5 ☐	4 ☐	3 ☐	2 ☐	1 ☒		5 ☐	4 ☐	3 ☐	2 ☐	1 ☐

SPECIAL TEST SCORES

NAME	FORM	DATE	SCORE
ETST	7A	1-10-47	QUAL

CIVILIAN EDUCATION

MOST SIGNIFICANT EDUCATION: High School

DATES: 9/35 6/39

YEARS EDUCATION	DEGREE	NAME OF COLLEGE
12	H.S.	-

MAJOR COURSES: Academic

SPEC. STUDIES	MATH	PHYS	TYPING	SHORTHAND
HIGH SCHOOL	3	1	WPM -	WPM -
COLLEGE	-	-	WPM -	WPM -

SPECIALIZED TRAINING (*Vocational, trade, technical, business*)

Night H.S. Course - 1½ years
Night Tech. School - Printing 3 mos.
I.C.S. course - Radio, incomplete

PERSONAL

LEISURE TIME ACTIVITIES: Radio-built 5 tube rec. from MFD parts

SPORTS IN WHICH QUALIFIED: Football-H.S. var. 3 yrs, earned 3 letters

TALENT FOR PUBLIC ENTERTAINMENT: -

HIGHEST POSITION OF LEADERSHIP: Captain, H.S. Football team

PHYSICAL

VISION	CORR.	UNCORR.	
RIGHT EYE	-	20/20	QUALIFIED FOR Submarines
LEFT EYE	20/20	18/20	NOT QUALIFIED FOR -

check one

☒ RIGHT HANDED ☐ LEFT HANDED

4B

CIVILIAN EXPERIENCE

MAIN OCCUPATION (DOT TITLE): ELECTRIC MOTOR REPAIRMAN HELPER (Any Ind.)

EMPLOYER'S NAME		LOCATION	
SMITH ELECTRIC MOTOR REP.		Buffalo, N.Y.	
YRS. SERV. 2	WKLY. WAGE $30	TRADE TEST NAME ElectMotorRepairman	SCORE Some Info.

DUTIES, SKILLS, MACHINES

Tore down electric motors and generators. Replaced broken parts. Stripped old coil from armature. Assisted in winding armature. Repaired electric starters and switches.

SECOND BEST OCCUPATION (DOT TITLE) (Auto. Serv.)
AUTOMOBILE SERVICE STATION ATTENDANT

EMPLOYER'S NAME		LOCATION	
JONES' SUPER SERVICE		Buffalo, N.Y.	
YRS. SERV. 1	WKLY. WAGE $25	TRADE TEST NAME -	SCORE -

DUTIES, SKILLS, MACHINES

Supplied autos and trucks with oil, water, air and gasoline. Sold and installed accessories, horns, radios, windshield wipers, etc.

OTHER WORK EXPERIENCE

Truck driver - drove milk truck making routine milk deliveries and collecting money for company.

RECOMMENDATIONS AND REMARKS

2-22-64

RECOMMENDED TO STRIKE FOR: Electrician's mate

I VOLUNTEER FOR: Submarines

INITIALS: JWD

INTERVIEWEE'S SIGNATURE: John William Doe
John William Doe

VERIFIED: George D. Smith
George D. Smith
PN2 (Y2) USN

DATE: 1-15-47

USE OF FORM NAVPERS 601 — PAGE 4A:4B OF ENLISTED SERVICE RECORD to permit effective assignment. For example, in order to make an appropriate assignment of an electrician's mate, first class, it is necessary to have the following information:

Does the man have sea experience?

What is his highest Navy job skill?

On what type of ship or station was his job skill obtained?

What is his general intelligence level, his arithmetical ability and his mechanical aptitude?

How much formal education does he possess?

The answers to these and many other personnel detailing problems are provided by the page 4A-4B and the Navy Job Classification Code.

Naval District Headquarters, Receiving Stations, Naval Training Centers and certain other personnel distribution centers are staffed with trained Personnel Men (Classification Interviewers) who are available on request to assist ships and stations with their enlisted classification problems such as testing, interviewing and instructing of activity personnel in classification procedures. Ships and stations should avail themselves of these services whenever necessary.

3. *Identifying Naval Job Skills.* A numerical code system for identifying the more than 800 naval jobs was inaugurated in October 1945. It uses a seven-digit code, the first five digits representing the coded skill, the last two digits representing the type of activity, sea or shore, at which the coded skill was attained. The *Manual of Enlisted Navy Job Classifications* (NavPers 15105), the working tool of the Navy Job Classification System, lists the title, code, and description of enlisted naval jobs. New jobs are added and obsolete jobs are removed through changes to the manual which are issued approximately every quarter.

Navy Job Classification Codes are assigned enlisted personnel by officers or petty officers who supervise their work and consequently are in the best position to know just what level of skill a man has attained. As many as four codes may be assigned depending upon the number of basically different job skills possessed. Normally, a man's primary code should reflect his job skill within his rating, for it is within his rating that a man must qualify for advancement, therefore it is here that his most significant skill should lie. Officers assigning Navy Job Classification Codes should weigh carefully the assignment of a primary code that is outside a man's rating. They must be sure that the code being assigned is going to accurately job identify the man's primary skill as well as his significant skill outside his rating, for reference should a request for a change in rate be submitted.

Accurate detailing and full utilization of manpower requires that the skills attained by enlisted personnel are adequately identified. The assignment of appropriate Navy Job Classification Codes and the maintenance of these codes on a current basis, will assure that such job identification is available to all officers responsible for the optimum utilization of naval enlisted manpower.

ADVANCEMENT IN RATING

How Accomplished

Advancement in rating of enlisted personnel is the result, not the cause, of training. Advancement in itself is of no benefit either to the individual or to the Naval Service. As a result of practical experience encountered in preparing for advancement and from the theoretical knowledge absorbed from instructional manuals and textbooks, the trainee becomes qualified to advance to a higher level of responsibility in his chosen field of work. Where competition is required only the best prepared of those candidates competing earn the advancement. Each man should be encouraged to prepare himself for advancement and to take advantage of each opportunity for advancement as it occurs. The organization training officer and each division training officer have important duties in carrying out an effective professional education program and to maintain a continual check on the progress of the personnel for whom each such officer is responsible.

Practically all advancements are effected on the job, that is, as a result of in-service training and education. The division officer should always bear in mind that, in addition to his material maintenance duties and his watch duties, he is responsible for the education and progress of each individual in his division. The division officer and his junior officer or officers are at one time teachers, proctors, and lecturers to all personnel under their charge.

The training program administered aboard each unit of the Navy has several objectives:

1. To develop in each candidate the skills necessary for the rating to which the individual candidate is adaptable.
2. To impart the knowledge which is related to the skills.
3. To develop petty officer attributes, with emphasis on the quality of leadership.

The division training officer has at least four major functions in connection with the advancement of enlisted personnel:

1. He encourages all personnel, especially those considered as outstanding, without favoritism, to prepare themselves to meet the qualifications of petty officers in order that these will be a pool of potential petty officers available at all times.

2. He gives exact information on the requirements for advancement in rating.

3. He follows the procedures which have been set up for training and advancement.

4. He carries on training programs utilizing training courses, or pertinent parts thereof, that will assist personnel in preparing for advancement in rating.

Bureau Requirements

Any enlisted person who meets the requirements and who qualifies under the existing policies of the Chief of Naval Personnel can advance to a petty officer rate and can further advance successively within that rating. The following general requirements are established in the *Bureau of Naval Personnel Manual:*

(1) Before an enlisted person may be advanced in rating he or she must:
  (a) Have met certain requirements as to length of service.
  (b) Have met certain requirements as to marks in proficiency in rating and conduct.
  (c) Have completed satisfactorily the Navy training course, where a suitable course is available, for the rate to which the candidate is being prepared for advancement.
  (d) Have completed satisfactorily a course of instruction at a service school, when such is required.
  (e) Have qualified fully in the practical factors for the rate for which a candidate, as prescribed in the *Manual of Qualifications for Advancement in Rating,* NavPers 18068.
  (f) Have been considered by senior petty officers (if any) and officers as capable of performing the duties of the higher rate and have been recommended by the commanding officer.
  (g) Have passed satisfactorily an examination in the subject "Military Requirements for All Men in the Navy."
  (h) Have passed satisfactorily a professional examination for the rate involved as prescribed in the *Manual of Qualifications for Advancement in Rating,* NavPers 18068.

(2) The Chief of Naval Personnel has authorized commanding officers to effect advancements in rating of enlisted personnel under their command:
  (a) To fill vacancies on the ship or station concerned when specifically permitted to do so by effective instructions.
  (b) In accordance with Bureau of Naval Personnel letters to commanding officers concerning individuals.
  (c) By assignment of quotas to specific administrative or organizational commands.
  (d) From eligibility lists maintained in the Bureau of Naval Personnel as a result of competitive service-wide examinations.

Determining Qualifications

It should be made clear to all personnel that the fact that they have met the *minimum* requirements for advancement does not necessarily mean that they *will* be advanced *immediately.* However, all personnel should be encouraged to qualify for the next higher rate even though an advancement may not be forthcoming immediately in each particular case.

Records should be kept of such items as attendance at lectures or classes and the completion of assignments in order. When all preliminary preparations have been made, an examination on the subject matter should be given. If the training course is satisfactorily completed, a certificate, signed by the commanding officer, should be issued to the individual concerned and an appropriate entry made in the individual's service record. Completion of the training course and of the training course examination should not be confused with the final qualifying examination given by the ship or station's formal examining board. Upon completion of the training course examination, completion of all practical factors, and fulfillment of all other eligibility particulars, a candidate may be recommended for advancement by his (or her) division officer to the commanding officer.

The commanding officer, as advised by the ship or station's formal examining board, is the final authority as to whether or not an individual is qualified in all respects for advancement.

In general, the examining board for all personnel consists of three naval officers and, wherever practicable, at least one should have had at least two years' active naval service. In general the membership of the board should include at least one officer who is qualified in the specialty in which the candidate is being examined. Usually the board composes the examination, conducts the actual examining, and marks the papers of the candidates. The results are reported by Form NavPers 624 to the CO.

There are numerous official publications in the way of training courses issued by the Bureau of Naval Personnel, as well as many standard textbooks on the various occupational fields of work. No attempt is made here to list such publications as this list will continually change with additions and deletions. Current effective catalogs or requisition lists of advancement and training aids will contain the latest information on the titles and NavPers numbers of the instruction and question books available. Training periodicals published by the Bureau of Naval Personnel and by the various technical bureaus and offices furnish excellent means of keeping abreast of the current training publication situation.

It is pertinent to state that the details of carrying out the division instruction program are usually the responsibility of the junior division officer, if there is one. The division officer, under the guidance of the organization training officer, outlines the course of instruction applicable to that division and conducts a certain proportion of the instruction classes. However, the main weight of keeping the records and the continual checking on the progress of each individual in the completion of study assignments and practical factors usually fall on the junior division officer or the organization training officer in small units. These routine duties are not glamorous and, if properly carried out, are not simple. However, if these duties are slighted or improperly handled, the officer to whom they are nominally assigned will fail to gain the respect and confidence of the enlisted personnel of his organization. Personnel being led or directed will excuse honest mistakes of inexperience at first; however, they cannot be hoodwinked or misinformed for very long. In addition, the attitude of the enlisted personnel of a division toward their division officer or division junior officer is soon evident to other officers.

It is assumed that each and every officer of the United States Naval Service is desirous of performing his assigned duties in the best maner of which he is capable. An important duty assigned is that of an honest interest in the enlisted personnel for whom he is responsible. Rank as an officer carries with it not only privilege but responsibility for and to the personnel assigned to his command. The successful officer is the one who realizes the extent of his responsibilities, whether full time or part time, and meets those responsibilities in an interested, intelligent, energetic, and judicious manner.

NAVY RATINGS

The following brief descriptions of the duties and responsibilities of naval ratings are based on the rating structure which went into effect early in 1948.

I. Deck Group

Boatswain's Mate (BM). The boatswain's mate serves aboard all types of ships and at most shore stations; in battle, acts as gun captain, member of damage-control party, or is stationed on bridge; requires thorough knowledge of seamanship, and understanding of all deck work connected with boatswain's mate and anchor watches, as well as familiarity with rigging, hawsers, winches, hoists, tackle, lines, and cargo nets; may have to take a turn at the wheel, sew canvas, or double as gun captain; must know signal flags, lights, and navigation instruments; directs handling and stowage of cargo, and stowage and care of canvas; maintains and operates hoisting and landing gear; must know how to handle small boats; directs boat crews in landing or rescue operations.

Quartermaster (QM). Quartermasters are assigned to all types of ships and serve in the pilothouse, on the bridge or signal bridge, or in the charthouse. A quartermaster takes care of the ship's navigation publications, charts, and tables; must know how to use and care for navigational instruments; trains and supervises helmsmen; checks bearings and soundings and plots course; must know whistle, bell, and light signals and Rules of the Road; responsibilities in connection with visual communications make it essential that he know blinker signaling, and semaphore and signal flags.

Sonarman (SO). The sonarman serves on ships fitted with sonar apparatus (submarines and other antisubmarine craft); may operate underwater sound stations at naval bases and harbor defense stations. He distinguishes and interprets echoes received by sonar equipment and makes necessary reports to the conning officer; interprets sonic and magnetic information received by electronic and magnetic harbor defense equipment; may use international Morse code in transmitting and receiving messages on sonar equipment; operates sonar countermeasures equipment; performs routine tests and adjustments on equipment and may make minor repairs.

Radarman (RD). Radarmen are stationed on all types of ships and small craft and at some shore stations. The radarman must know the function and operating principle of all radar equipment aboard, and be able to use such equipment in controlling aircraft approaches, in tracking and searching, in intercepting aircraft and surface vessels; operates all radar countermeasures equipment aboard; interprets and plots all information received; makes routine tests and adjustments and performs minor repairs.

II. Ordnance Group

Torpedoman's Mate (TM). The torpedoman's mate is stationed on tenders and repair ships, at naval bases, and on all ships carrying torpedo tubes — destroyers, destroyer escorts, submarines, and PT boats. He checks, maintains, repairs, and overhauls underwater ordnance and underwater ordnance detectors; maintains and repairs torpedo-firing equipment, and depth-charge release equipment; supervises storage of underwater ordnance. Battle station is at torpedo tubes, depth charges, or torpedo directors.

Gunner's Mate (GM). Gunner's mates are assigned to all fighting ships, in battle may be at guns or in magazine to supervise ammunition handling. The gunner's mate is responsible for operation and maintenance of guns, rocket launchers, and turrets; maintains and stows ammunition, projectiles, power bags, fuzes, rockets, bombs, and pyrotechnics; repairs and maintains recoil mechanisms, bearings, breech mechanisms, firing attachments, loading mechanisms, and hoists; inspects magazines for proper temperature, and tests powder; acts as demolition expert in placing and firing explosives.

Fire Controlman (FC). The fire controlman serves aboard most fighting ships, including submarines. He operates fire-control equipment and conducts operational tests, routine shipboard maintenance, and minor work on such equipment; adjusts optical rangefinders and makes minor optical repairs. He may serve as talker who transmits data, orders, and instructions between fire-control stations; or as plotter who enters data into the computing machines; or as director pointer and trainer.

Fire Control Technician (FT). Fire control technicians serve principally in repair ships and at shore-based repair activities; may be assigned to large combatant ships. The fire control technician makes major detailed casualty analyses, major repairs, and overhauls on fire-control equipment; uses all tools and electrical and mechanical measuring instruments necessary in maintenance and repair of fire-control equipment, fire-control radar, directors, and associated equipment; reads and works from mechanical drawings and wiring diagrams; boresights and aligns guns and directors; overhauls hydraulic power drives and performs minor maintenance on optical fire-control equipment.

Mineman (MN). Minemen serve on ships carrying mines; may be stationed elsewhere as necessary for performance of the following duties. They overhaul and adjust all types of naval mines, depth charges, handling equipment, and releasing mechanisms; prepare mines and depth charges for dropping; load and stow them on ships, and operate releasing mechanisms. They also test component parts of mines for proper operation and make special electrical hook-ups.

III. Electronics Group

Electronics Technician (ET). The electronics technician serves on all types of ships and at shore stations having electronic equipment. At general quarters, stands by to perform instant electronics repair. He is responsible for maintenance and repair of all shipboard electronic equipment, and other types of communication, detection, and ranging equipment employing electronic circuits; uses many types of precision test equipment as cathode-ray oscilloscopes, frequency meters, and vacuum-tube testers; needs knowledge of circuits and circuit theory, direct and alternating current, various types of vacuum tubes, and electronic and wave theory; understands construction and function of all electronic equipment aboard.

IV. Precision Equipment Group

Instrumentman (IM). Instrumentmen serve aboard repair ships and at shore stations. A man with this rating installs, tests, calibrates, overhauls, and repairs such instruments as meters, gages, office machines, watches, and clocks; works from blueprints and schematic drawings; keeps record of work done in repair shop and prepares requisitions for spare parts and supplies; repairs mechanical parts of electrical instruments. Much of his time may be devoted to repair of typewriters.

Opticalman (OM). Opticalmen serve aboard repair ships and at naval repair facilities ashore. The opticalman overhauls, repairs, and adjusts optical equipment (binoculars, telescopes, octants, sextants, rangefinders, periscopes). In overhaul, he inspects, performs casualty analyses, and disassembles, repairs, or replaces defective parts; overhaul also includes collimation, adjustment, sealing, gassing, and drying. He uses all hand and machine tools necessary for optical repair work, and many precision mechanical and optical measuring instruments; replates mirrors; maintains logs and records of work done in optical shop; trains and supervises personnel in adjustment and repair of optical equipment.

V. Administrative and Clerical Group

Teleman (TE). Telemen are stationed aboard all but the smallest ships and at all shore stations; act as communications yeomen and registered publication clerks; receive and transmit radio messages on voice circuits; operate teletypewriters and facsimile equipment. In higher rates they perform coding board functions after being sworn to secrecy; operate Navy post offices.

Radioman (RM). Radiomen serve aboard all ships and at all radio stations ashore, operating radios, radio direction finders, teletypewriters, and facsimile equipment, and transmitting and receiving messages in international Morse code. The radioman makes operational adjustments to and performs upkeep on equipment; obtains bearings with radio direction finders; stands watches on teletypewriter, voice radio, and telegraph circuits; copies broadcasts and keeps required logs; lubricates, cleans, and detects mechanical difficulties in radios and typewriters; rigs emergency antennas; supervises and trains strikers.

Communications Technician (CT). Communications technicians perform specialized communications duty on certain staffs, ships, and at shore stations. In this rating a man performs routine clerical duties and maintain files, logs, and records; operates special equipment such as typewriters, teletypewriters, keypunch equipment, and various other devices; constructs charts, graphs, and tables; stands watches on any communications circuit; performs many operations requiring independent judgment and initiative; operates radio direction finders, and takes and plots bearings and positions; acts as communications supervisor and trains strikers in communications duties.

Yeoman (YN). All naval activities ashore and afloat require the services of yeomen. A yeoman must be familiar with official letter and report forms, routing of naval correspondence, and with the Navy filing system. He performs typing and clerical duties, prepares reports, maintains office records and files, and operates office machines; is an expert on naval regulations, manuals, circular letters, and directives; is in charge of personnel records and furnishes information on ratings, insurance, transportation, and promotions.

Personnel Man (PN). Personnel men ashore or afloat work in the offices of the executive, personnel, training, or recruiting officers, or in the chaplain's office. A personnel man performs administration duties; interviews and classifies enlisted men with reference to Navy job classification system; must know rating structure, requirements for advancement in rating, educational and training aids, welfare and recreational activities, and benefits available for naval personnel.

Machine Accountant (MA). Machine accountants serve aboard large ships and at shore stations employing accounting machines. In this rating a man operates and maintains key-punching and key-verifying equipment to record statistical data on tabulating cards; sets up and operates punched-card machines; assembles incoming information and makes routine and special reports as required; makes minor repairs to machine; is an expert in machine-accounting procedures.

Storekeeper (SK). All shore activities require storekeepers, as do all ships except the smallest types. A storekeeper procures, stows, preserves, packages, and issues clothing, spare parts, provisions, technical items, and all other supplies needed; keeps inventories, prepares requisitions, and checks incoming supplies and stock for quantity; may perform some disbursing duties; operates a typewriter and other office machines.

Disbursing Clerk (DK). The disbursing clerk serves in the supply department of large ships and at shore stations. He processes all matters pertaining to Navy pay rolls, the disbursing of funds in payment for services or supplies furnished to the Navy, reimbursement of naval personnel for expenses incurred in the line of duty, and other financial transactions; prepares and types financial accounts and reports; has knowledge of basic principles of naval accounting system; is familiar with such matters as medals and awards, allowances for subsistence, uniforms, reenlistment pay, family allowances, longevity, overseas pay, flight pay, transportation, extra compensation; knows Navy's system of disbursing funds in payment for supplies and services rendered.

Commissaryman (CS). Commissarymen serve at shore stations and aboard ship. They ordinarily serve as cooks and bakers but at large shore stations and in large ships they may also serve as butchers. They prepare menus, keep cost accounts, assist in ordering provisions, and check deliveries for quantity and quality; are responsible for proper storage of all food products and for the care of galleys, bake shops, refrigerator spaces, and provision issue rooms.

Ship's Serviceman (SH). Ship's servicemen serve on all the larger ships and at all shore activities having ship's service facilities. Duties consist of managing the ship's service and ship's store activities afloat and ashore, and performing clerical, sales, and managerial functions in naval commissary stores. In lower pay grades of this rating a man may specialize as barber, cobbler, laundryman, tailor, fountain clerk, or store clerk; in upper pay grades he may be a supervisor or assistant manager of a ship's store or ship's service store.

Journalist (JO). Journalists are assigned to larger ships or to a shore station; may serve in large naval public relations offices ashore. The journalist writes news stories or selects and rewrites press releases; edits copy and art, writes captions, and prepares page layouts; operates a typewriter and teletype machine;

prepares ship's history and writes articles on personnel aboard; prepares radio scripts for news broadcasts; manages and edits ship and station newspapers, and serves on staff of other Navy publications.

VI. Miscellaneous Group

Lithographer (LI). A lithographer is assigned to activities ashore and afloat that have offset-lithography equipment. In low pay grades, he specializes as a pressman, or as a cameraman and platemaker. As a pressman he sets up, inks, adjusts, and runs presses; cleans, lubricates, and maintains pressroom equipment. As a cameraman and platemaker he operates process cameras; develops and processes negatives; lays out and assembles copy; makes plates; and cleans lubricates, and maintains photographic and platemaking equipment. Chief lithographers know all phases of offset-lithographic work and are capable of managing a lithographic plant.

Printer (PI). The printer operates letter-press equipment at shore stations and aboard certain types of ships. He operates linotype machines, small automatic presses, hand-operated cutters, and binding equipment; in large shops he operates multicolor presses. He cleans, lubricates, and maintains equipment; performs such duties as copy preparation, composition, presswork, and binding; reads copy and galley proofs and marks copy for composition; is able to interpret and use proofreaders' marks.

Musician (MU). Musicians may be assigned to shore stations or to battleships, carriers, or cruisers, serving as members of bands or orchestras which provide music for military ceremonies, concerts, parades, and various recreational activities. They play one or more instruments and care for and make minor adjustments to whatever instrument(s) they play. In higher pay grades they plan and conduct as well as perform; may be arrangers and copyists as well.

Photographer's Mate (PH). Photographer's mates serve at bases or stations or in larger ships. They are trained in all phases of photography and accomplish all photography work required by the Naval Service. They record actual or simulated battle conditions and make pictorial records of historical and newsworthy events aboard ship or at shore stations. They operate, maintain, and repair various types of motion-picture and still cameras and follow through on subsequent developing, printing, and finishing operations. They perform microfilm, photostat, copying, and news photography.

Draftsman (DM). A draftsman usually serves ashore but may be assigned to repair ships. He prepares, alters, checks, and files topographical, architectural, structural, mechanical, electrical, and statistical drawings; makes plans, sketches, tracings, illustrations, maps, and charts from sketches, notes and instructions; prepares specifications, material estimates, and accurate bills of material; makes, files, and alters blueprints; operates blueprinting and similar machines; does neat lettering; cuts, lays out, arranges, and fastens photographs, lettering, and sketches to form required patterns, designs, and maps.

VII. Engineering and Hull Group

Machinist's Mate (MM). The machinist's mate is usually assigned to a ship but may also serve at shore stations. He operates and maintains main engines or turbines, and all auxiliary engine-room and boiler-room equipment (pumps, compressors, valves, oil purifiers, heat exchangers, governors, reduction gears). He also maintains and repairs outside machinery (steering engine, cranes, elevators, winches); operates and maintains refrigeration and air-conditioning equipment; may be assigned to duty involving the manufacture, stowage, purification, transportation, and transfer of industrial gases such as oxygen, acetylene, carbon dioxide, and helium.

Machinery Repairman (MR). Machinery repairmen are usually assigned to a naval shipyard or other major repair base. In this rating, a man performs all types of shop work requiring the skillful use of lathes, milling machines, grinders, power saws, drill presses, and other machine tools. He also uses hand tools and measuring instruments common to machine shops; installs, makes major repairs to, and over-hauls shipboard propulsion and auxiliary equipment, such as engines, turbines, shafts, bearings, reduction gears, propellers, evaporators, compressors, pumps, and winches.

Boilerman (BT). Boilermen are assigned to steam-propelled vessels; may serve at naval shipyards or other repair bases. Duties consist of operating all types of marine boilers and fireroom machinery, and transferring, testing, and taking inventories of fuels and water. The boilerman also maintains and repairs boilers, pumps, and associated machinery; plans, supervises, and coordinates these activities under the direction of the engineering officer. He uses all hand, power-driven, and pneumatic tools commonly employed in boiler maintenance and repair; supervises steaming watches, and is responsible for immediate action in case of difficulty in boiler or fireroom; may serve as member of damage-control or repair party.

Engineman (EN). The engineman serves in almost all types of ships, at naval shipyards, and at repair facilities afloat and ashore. He maintains, operates, and repairs internal combustion engines; usually operates and repairs engines in diesel-driven craft, but may work on high-powered gasoline engines, such as those used in PT boats; operates and maintains auxiliary engines, and the refrigeration and air-conditioning equipment on diesel-driven vessels; uses all ordinary hand, shop, and machine tools, and precision measuring instruments employed in engine overhaul; works from drawings, sketches, and instruction books, and makes working sketches in directing the work of engine overhaul; supervises engine watches and takes full charge of engine room on diesel-driven craft; keeps necessary records and prepares reports; supervises the work and training of engineman strikers.

Electrician's Mate (EM). The EM serves on all types of ships and at naval shipyards and bases. He installs, maintains, and repairs generators, electric motors, searchlights, yardarm blinkers, and the general lighting and power distribution systems employed aboard ship; locates and repairs defects in wiring; uses electrician's hand tools and electrical measuring instruments; performs soldering and brazing operations. In addition to maintenance and repair duties, he may stand an engineroom watch, being at such time responsible for proper operation of all electrical equipment and control panels.

I.C. Electrician (IC). The I.C. electrician serves principally aboard ship but may be assigned to a naval shipyard or repair base. He stands interior communications and gyrocompass watches; maintains and repairs all I.C. systems, including synchro units, gyrocompass systems, engine telegraphs, rudder position indicators, and other information equipment; maintains motion picture equipment, public address systems, electric megaphones, and other announcing gear.

Metalsmith (ME). Metalsmiths are assigned to all but the smallest ships, and to naval shipyards and bases. Duties of this rating require thorough knowledge of all metals found aboard ship. The metalsmith must be able to heat-treat and case-harden metals, and to cut, weld, and rivet them. He designs, constructs, and repairs sheet-metal lockers, trays, cabinets, and chests. Together with the pipefitter and damage controlman he is responsible for maintaining and repairing the ship's ventilating and drainage systems. He uses power shears, brakes, scarfers, edgers, and forming dies, and must be skilled in the use of tools for brazing, soldering, welding, riveting, and layout. He tests and replaces watertight gaskets.

Pipe Fitter (FP). Pipe fitters are usually assigned to construction and ship repair units ashore or to repair ships. A pipe fitter lays out, assembles, fabricates, and repairs shipboard machinery and hull piping systems; installs, maintains, and repairs all valves, piping, and plumbing system fixtures and fittings; welds, brazes, solders, rolls, bends, and forms pipes and tubing; lags and covers pipes; prepares templates, and works from drawings or rough sketches. In his work he uses pipe fitter's, plumber's and coppersmith's tools as well as ordinary hand and shop tools; also uses soldering and oxyacetylene and arc-welding equipment.

Damage Controlman (DC). Damage controlmen are assigned to all but the smallest ships, and are specialists in the theory, techniques, skills, and equipment of fire fighting, chemical warfare, carpentry, painting, and general damage control. In this rating, a man instructs and coordinates the activities of damage-control parties; has responsibility for maintaining and repairing damage-control equipment; performs all types of carpentry work; repairs and maintains woodwork aboard ship, including small boats; prepares shoring, braces, and other jury rigs used in damage control; has charge of the paint shop and paint locker, and can mix paint and rig scaffolding, as well as perform required painting.

Patternmaker (PM). The patternmaker may be assigned to a repair ship but is usually assigned to a naval shipyard or other major repair base ashore. He produces the wooden or metal patterns, core boxes, and flasks used by molders in a naval foundry. He mounts patterns on molding boards for production molding; makes master patterns and core boxes for casting aluminum and brass patterns; finishes metal patterns; makes full-scale layouts of wooden pattern core boxes and templates; indexes and stores patterns. He is expert in the use of all woodworking and metalworking tools and measuring instruments; works from drawings and sketches; frequently instructs molders and coremakers in their work and also instructs strikers in the duties of their rating.

Molder (ML). Molders may be assigned to repair ships; usually are assigned to naval shipyards and other shore-based repair and manufacturing facilities that have foundries. The molder makes cores, rigs flasks, prepares "heats" of metals, and pours castings of ferrous, nonferrous, and alloy metals; shot-blasts or sand-blasts cooled castings; works from patterns; uses open and blind risers, internal and external chills, and applies adequate gates to insure the production of sound castings; operates standard hardness-testing equipment; supervises strikers in general foundry and cupola practices.

VIII. Construction Group

Surveyor (SV). Surveyors are usually part of a construction battalion. A surveyor makes reconnaissance, preliminary, and final location surveys for roads, airfields, pipelines, ditches, buildings, drainage structures, and waterfront construction; makes hydrographic, topographic, and triangulation surveys, maps, and profiles; computes amount of material to be moved in cuts and fills; computes positions and azimuths by sun and star sights; makes soundings and lays out all types of construction work, including grade stakes and batter boards; trains strikers in surveying.

Construction Electrician's Mate (CE). Construction electrician's mates are usually assigned to construction battalions, serving at naval shore activities. They install, operate, maintain, and repair the electrical power-generating equipment, distribution systems, transformers, switchboards, distribution panels, motors, inside wiring, and lighting fixtures at various naval activities. They erect poles, attach insulators, string wires, and lay cable for high-tension power lines and for communication lines; maintain and repair the various types of electrical equipment; install, operate, maintain, and repair communication equipment, telephone exchanges, switchboards, public address systems, interoffice communication systems, fire alarm systems, and portable radio equipment at advanced bases.

Driver (CD). The driver is assigned to any location ashore where heavy construction is undertaken, and usually serves as member of a construction battalion. The driver checks, operates, maintains, lubricates, and repairs automotive and heavy construction equipment such as trucks, tractors, bulldozers, shovels, cranes, pile drivers, ditchers, rollers, graders, and hoisting equipment. He rigs cable assemblies and applies special attachments to such equipment; works under the direction of engineers in excavation and construction operations; makes adjustments to the mechanisms in the field as required in keeping them in top operating condition; reads, interprets, and follows engineers' grade stakes and other markings in making cuts and fills; prepares operational reports and keeps equipment records; organizes and administers the operation of equipment garages, and supervises the work and training of driver strikers.

Mechanic (CM). Mechanics serve at naval shipyards, naval bases, and advanced bases; usually are members of a construction battalion. They check, test, maintain, lubricate, repair, and overhaul automotive and heavy construction equipment such as trucks, tractors, bulldozers, shovels, cranes, ditchers, rollers, graders, hoisting engines, and other power-driven equipment used in advanced base construction; must be able to make adjustments to equipment sufficient to keep it operating efficiently; work on both diesel- and gasoline-powered equipment; operate special automotive repair equipment.

Builder (BU). Builders usually serve with construction battalions and may be assigned to shore stations anywhere. They construct, erect, maintain, and repair all types of wood or concrete structures, such as warehouses, hospitals, barracks, bridges, trestles, tanks, wharves and cofferdams; perform in addition such auxiliary operations as shoring, underpinning, pile jettying, capping, driving, and cribbing; operate sawmills, carpenter shops, and cabinet-making shops; build concrete forms, place reinforcing steel, and batch, mix, and place concrete in all types of structures including underwater installations; direct logging operations.

Steelworker (SW). A steelworker may be assigned to a cargo vessel, a repair ship, or tender; usually serves ashore on construction jobs performed by construction battalions. He rigs and erects A-frames, gin poles, derricks, hoists, booms, and special tackle to move and hoist heavy equipment or material; may also rig the cable assemblies used in heavy construction equipment such as bulldozers, power shovels, and cranes; performs such auxiliary operations as making cargo nets and slings and splicing cable; fabricates, places, fits, welds, cuts, and rivets steel shapes, plates, and built-up sections used in structural steel work.

Utilities Man (UT). The utilities man is one of the first to arrive at a new base; in time of war he may be assigned to an advanced base as member of a construction battalion. He installs, operates, maintains, and repairs boilers, evaporators, and equipment for the distillation and purification of water, as stills, sand filters, and pumps; maintains and repairs furnace brickwork, fuel pumps, condensers, evaporators, feed water heaters, injectors, and engines; performs the plumbing and pipefitting work required in the maintenance of the above equipment; makes chemical tests to determine the purity of water; maintains and operates water supply and sewage disposal plants; operates, services, and maintains the heavy machinery used to power public utilities stations.

IX. Aviation Group

Aviation Machinist's Mate (AD). The aviation machinist's mate may be assigned to a carrier, a naval air station, or other air activity; sometimes serves on a battleship or cruiser; may fly as member of an air crew; in which case he will probably act as flight engineer, keeping the plane in proper operating condition during flight. He requires familiarity with the theory of flight, and the various technical aspects of engine repair and operational maintenance, as well as with work in aircraft shops and hangers; works with hand and machine tools. The inexperienced aviation machinist's mate performs the simpler jobs, such as changing and repairing tires, warming up engines, cleaning and testing spark plugs, refueling and changing oil, and assisting in the handling of planes on the ground or deck; with increased experience he is assigned more responsible tasks as periodic checks, engine repair, and trouble shooting.

Aviation Electronics Technician (AT). Aviation electronics technicians are stationed wherever naval aircraft are based; during flight operations, they check and repair airborne electronic equipment. These men are skilled in maintaining, adjusting, testing, installing, and repairing all airborne electronic equipment installed in aircraft, such as radio, radar, loran, and fire-control equipment; require understanding of the construction and design of naval airplanes so that their work will not endanger the over-all efficiency and safety of the craft. They use all test instruments (general and special); maintain and install equipment following drawings and diagrams; keep performance and maintenance records; supervise work of strikers; organize and administer facilities for repair of aviation electronic equipment.

Aviation Electronicsman (AL). The aviation electronicsman usually serves on aircraft carriers or at naval air activities; may serve aboard a battleship or cruiser. In combat, he is aboard a plane, acting usually as gunner. In this rating a man acts as aircraft communicator, and is familiar with operating procedure and communication instructions applicable to aircraft; as a communications man he sends and receives messages by radiotelegraph and radiotelephone. Other duties include use of flashing light, semaphore, and flaghoists signals used in communication between ships and planes and taking bearings by radio direction finders. Aviation electronicsmen also operate, adjust, test, and perform routine maintenance checks and minor repairs to electronics equipment normally installed in naval aircraft, including radio, radar, loran, and radio altimeters.

Aviation Ordnanceman (AO). Aviation ordnancemen serve on carriers or at naval air activities ashore; may serve on battleships or cruisers. In this rating, a man maintains, repairs, installs, operates, services, and handles aviation ordnance equipment such as aircraft guns, turrets, powered gun mounts, rockets and rocket launchers, pyrotechnics, torpedo and bomb suspensions and release mechanisms, aircraft munitions and tow-target equipment. He also operates and performs routine servicing on technical aviation fire-control equipment and on aviation fire-control electronic equipment.

Air Controlman (AC). Air controlmen serve at airfields or are assigned to carriers. The air traffic of the Navy at airfields, seadromes, and on carriers is controlled by the air controlman, by means of radio, radar, flashing light, and flaghoists. As traffic control operator at an airport, he operates the field-lighting system, traffic control lights, and remote control equipment; keeps accurate and complete operating and material logs; and communicates with aircraft. He operates flashing light and flaghoist signal systems; is an important member of air operations and in these is responsible for dispatching and exercising coordinated control over all flights, preparing operations reports, and keeping current records of the position of all aircraft. He supplies data on air traffic, navigation, and weather and can recognize minimum flying conditions; operates radar; operates and makes adjustments to ground-controlled approach systems, interprets targets on radar screen and uses standard plotting procedures.

Aviation Boatswain's Mate (AB). Aviation boatswain's mates are assigned to naval air stations, air bases, and to aircraft carriers. The AB operates and maintains aircraft catapults, arresting gear and barriers, cranes, winches, booms, elevators, and other equipment used to handle aircraft, and aircraft fuel and lubricating-oil transfer systems; excels in seamanship required on flight and hangar decks; handles aircraft on carriers and seaplane ramps, in seaplane anchorages, in hangars, and parking areas; fuels and defuels aircraft; supervises deck, land, or sea crash rescue operations; operates and maintains small boats used in mooring and servicing aircraft and for carrying personnel.

Aviation Electrician's Mate (AE). The aviation electrician's mate is assigned to naval air activities ashore or afloat. He performs line and shop maintenance; installs, repairs, and adjusts aircraft electrical equipment and instruments; works on a-c and d-c circuits, wiring diagrams, motors, generators, voltage regulators, batteries, ignition systems, transformers, solenoids, condensers, induction coils, fuses, junction boxes, and other electrical equipment used in naval aviation, including accessories, gun turrets, bomb-release systems, amplidyne systems, and light and power systems; uses all electrician's hand tools and soldering equipment, as well as machine tools, and electrical testing and measuring equipment; traces through electrical systems to locate faults.

Aviation Structural Mechanic (AM). AM's may be assigned to carriers, battleships, or cruisers, or to naval air activities ashore. They maintain and repair aircraft surfaces, structures, and hydraulic systems; construct, repair, and align structural parts, as wings, elevators, ailerons, tabs, rudders, and fuselage structures; fabricate sheet metal; install, maintain, and repair tubing systems and flexible hose; perform oxyacetylene and arc-welding operations; repair and maintain rubber equipment, as tires and tubes; repair fabric-covered surfaces; make all periodic checks and inspections on aircraft.

Parachute Rigger (PR). A parachute rigger may be assigned to any air activity ashore or to an aircraft carrier. He is concerned primarily with the care and packing of parachutes; care includes drying, airing, storing, inspecting, repairing, and issuing. He inspects, tests, repairs, packs, and issues all other aviation-survival equipment, such as rubber rafts, life jackets, oxygen masks, fire-fighting apparatus, safety shoulder harnesses, and flight clothing; uses blueprints in repairing and modifying parachutes and survival equipment, uses and maintains power sewing machines, and uses measuring instruments in servicing parachutes and survival equipment; is responsible for procurement, custody, storage, accounting and issue of equipment; is frequently required to give instruction in proper use of all his equipment.

Aerographer's Mate (AG). Aerographer's mates are assigned to all naval air stations, advanced bases, battleships, cruisers, and aircraft carriers. The AG serves as the weatherman of the Navy, exploring the sky with instruments, such as barometers, anemometers, clinometers, and thermometers; tests, calibrates, and performs routine maintenance on all aerological instruments; interprets echoes caused on the radarscope by weather phenomena; makes pilot-balloon soundings and computes wind aloft, and makes radiosonde observations; makes short-range weather forecasts and diagrams for extended flights of aircraft showing necessary information such as flight levels, temperature, winds, visibility, clouds and fronts which will be encountered; prepares up-to-date weather maps, using standard weather codes to prevent information from falling into enemy's hands.

Aviation Photographer's Mate (AF). The aviation photographer's mate may serve at an air station ashore or aboard an aircraft carrier. He is responsible for the installation and maintenance of all aerial cameras and photographic equipment. He serves as a member of a flight crew, when so assigned, and is then responsible for the operation of other aircraft equipment such as drift sights, pyrotechnics, and armament. He installs and services gun cameras in aircraft. He uses standard aerial cameras in mapping and spotting photography. He must be familiar with all types of aerial still, view, and motion picture cameras.

Tradevman (TD). The tradevman installs, operates, maintains, and repairs training aids and devices that are used in connection with instruction in gunnery, aviation, and electronics; trains instructors in operation and use of these devices, many of which are extremely complicated mechanisms; usually serves at naval schools and training centers.

Aviation Storekeeper (AK). The aviation storekeeper serves aboard all ships that have aviation units and at all shore-based aviation activities. He procures, receives, identifies, checks, stows, preserves, and issues all types of naval aircraft and aeronautical equipment and accessories; prepares and types all records pertaining to procurement, stock control, and issuance of such equipment; takes inventories of aircraft and spare parts, completing necessary reports, and initiating surveys when appropriate. In higher pay grades the AK supervises and trains other personnel in the supply department, organizes and takes charge of large offices or storerooms, and supervises flow of work; uses typewriter and other office machines.

X. Medical Group

Hospital Corpsman (HM). Hospital corpsmen and hospital apprentices serve in sick bays, dental offices, or dispensaries of any ship or shore station, naval hospital, or hospital ship, or may be assigned to duty with the Marine Corps. The corpsman performs medical, dental, and clerical duties; gives first aid and performs ward and operating room duties; may be technician in such fields as x-ray, pharmacy, or epidemiology; may serve independently on small ships, performing all but major surgical duties; serves as assistant to medical officer in preventing and treating chemical warfare injuries and in giving physical examinations. The apprentice works in wards, sick bays, and dispensaries, learning how to care for the sick and injured and how to prevent illness among naval personnel.

XI. Dental Group

Dental Technician (DT). Dental technicians serve ashore or afloat, wherever dental services are offered naval personnel and their dependents. They perform dental, clinical, and clerical duties, as assisting the dental officer in treatment of patients, giving oral prophylactic treatment under supervision, rendering first aid, and carrying on various dental department administrative assignments. In addition they may be trained and qualified in dental prosthetic techniques, maintenance and repair of equipment, dental x-ray techniques, clinical laboratory procedures, acrylic eye illustration, pharmacy, and chemistry.

XII. Steward Group

Steward (SD). Stewards serve in wardrooms and officers' quarters afloat and ashore. While the commissaryman is concerned with food in the general mess, the steward has the duty of preparing food for the officers' mess. The steward serves as cook and baker; he assigns, directs, and supervises stewardsmen in making officers' beds, cleaning officers' living quarters, and serving meals in officers' messes; prepares menus and assists in ordering provisions; has responsibility for proper stowage of food; estimates quantities and plans for varieties of foodstuffs in preparing for cruises; supervises cutting and preparation of meat, baking of bread, pies, cakes, and pastries, and cooking of soups, vegetables, and meats; maintains high standards of service, cleanliness, and discipline in his area.

DISCHARGES ISSUED ENLISTED PERSONNEL

(In effect since 1 July 1947)

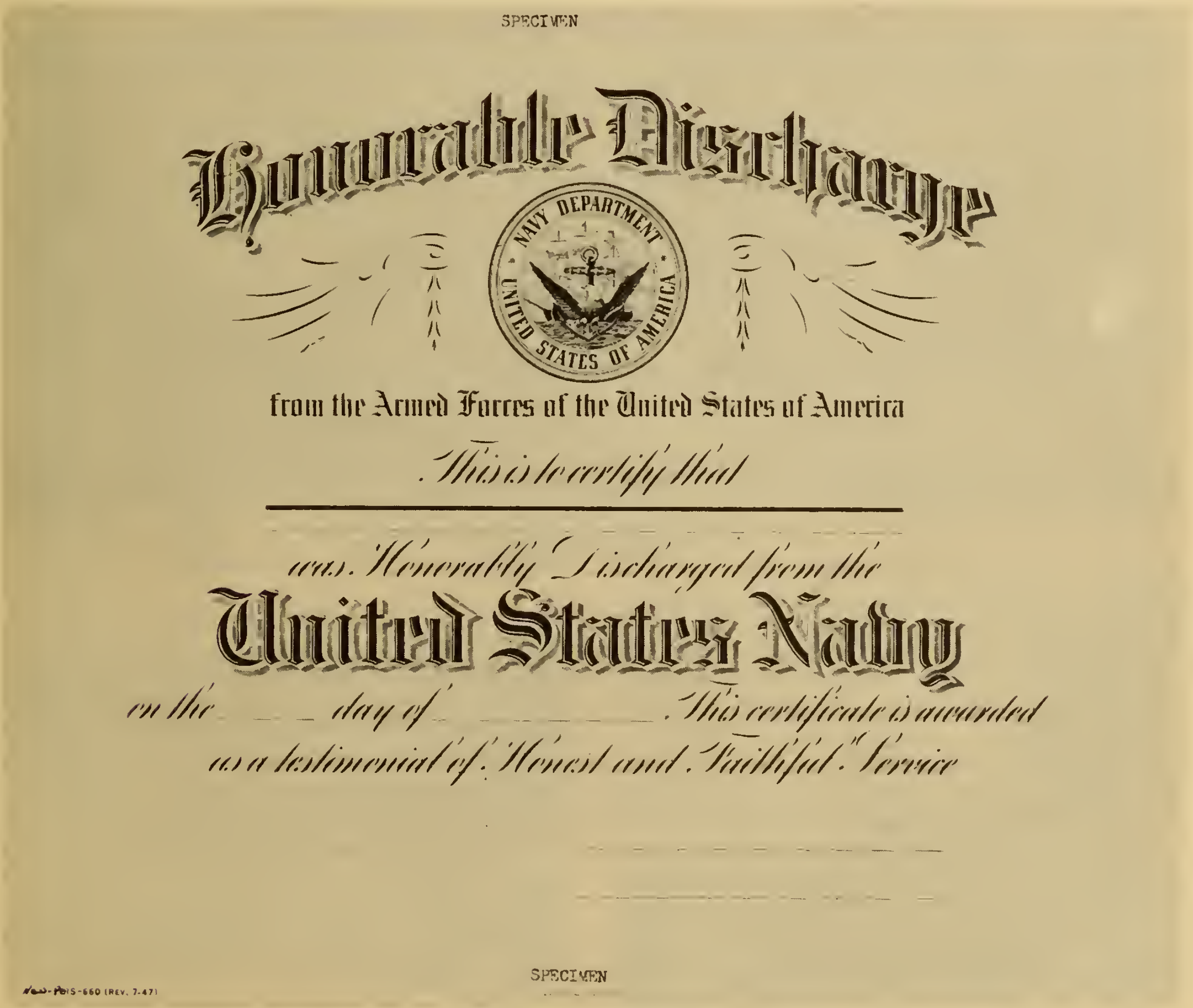
Types of Discharges

The five types of discharges listed below, with corresponding character of separation, are issued to enlisted and inducted personnel, USN and USNR, discharged from the Naval Service. (Art. C-10301, *Bureau of Naval Personnel Manual.*)

Type of Discharge	*Character of Separation*
Honorable Discharge	Honorable
General Discharge	Under honorable conditions
Undesirable Discharge	Other than honorable conditions
Bad Conduct Discharge	Other than honorable conditions
Dishonorable Discharge	Dishonorable

Discharges are effected for one of the following reasons:

a. expiration of enlistment
b. convenience of the government



SPECIMEN

Honorable Discharge

from the Armed Forces of the United States of America

This is to certify that

was Honorably Discharged from the

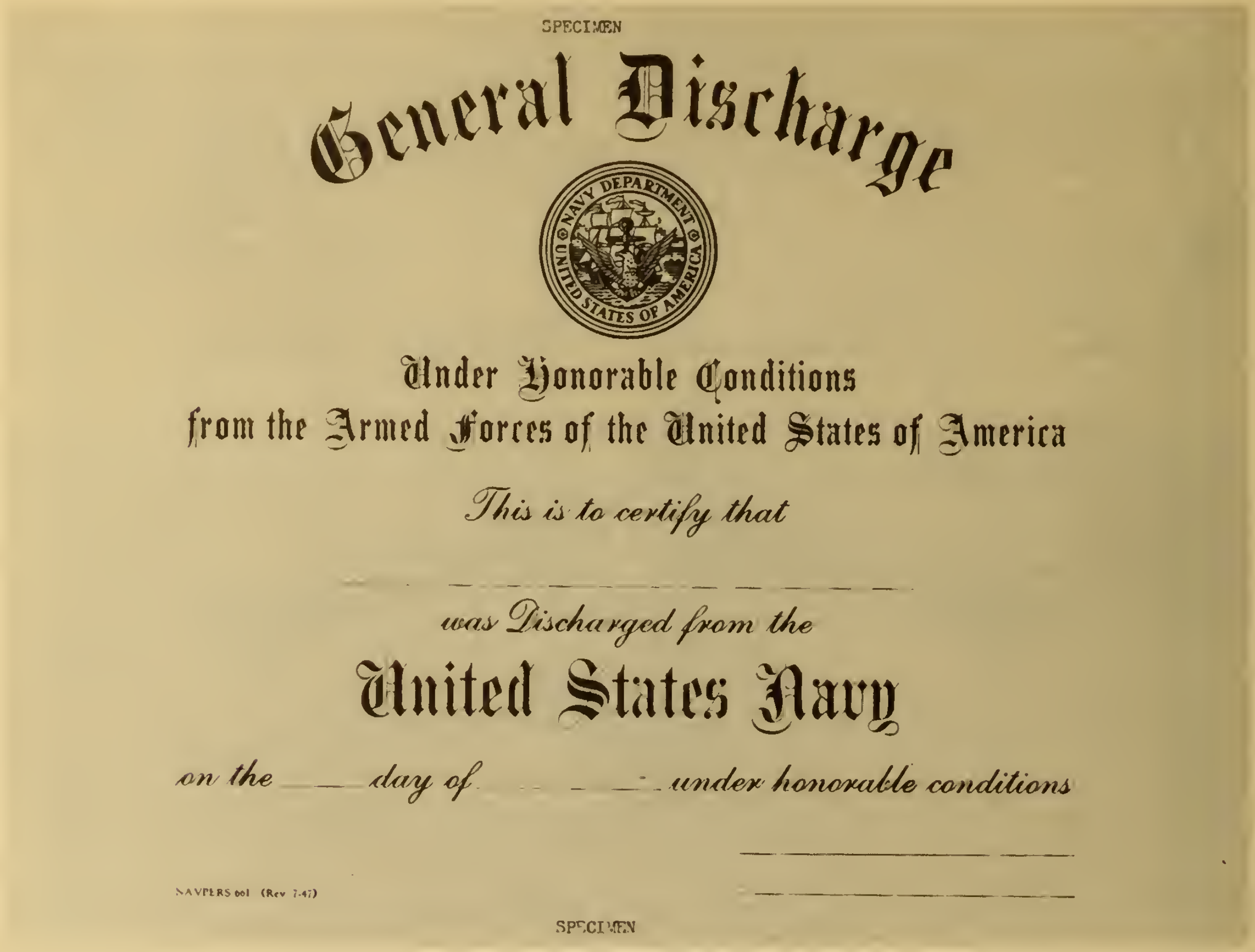
United States Navy

on the ____ day of ____________ This certificate is awarded as a testimonial of Honest and Faithful Service

SPECIMEN

NAV-PERS-660 (REV. 7-47)

HONORABLE DISCHARGE



SPECIMEN

General Discharge

NAVY DEPARTMENT
UNITED STATES OF AMERICA

Under Honorable Conditions
from the Armed Forces of the United States of America

This is to certify that

----

was Discharged from the

United States Navy

on the ____ *day of* ________ *under honorable conditions*

____

____

NAVPERS 661 (Rev 7-47)

SPECIMEN

GENERAL DISCHARGE

c. dependency
d. minority
e. disability
f. unsuitability
g. inaptitude
h. unfitness
i. misconduct
j. sentence of court-martial

1. *Honorable Discharge.* (Printed on white paper.)

An Honorable Discharge is given to personnel separated from the Naval Service for reasons (a) through (e) listed immediately above, whose final average marks are not less than 2.75 in proficiency in rating and 3.25 in conduct, and who, during their enlistment, were not convicted by a general court-martial or by more than one summary court-martial, and

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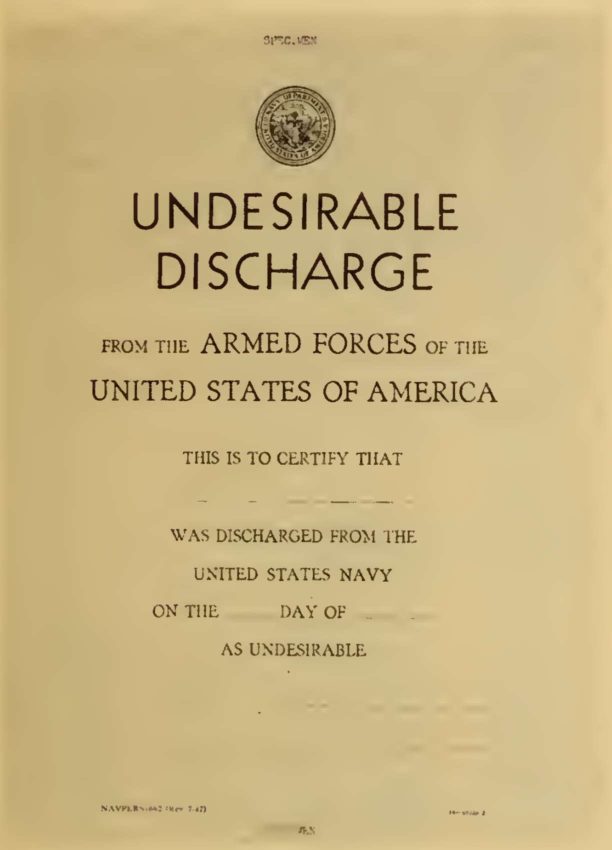
* *Special Award.* Regardless of previous record, an individual who has been awarded a Medal of Honor, Navy Cross, Distinguished Navy Medal, Silver Star Medal, Legion of Merit, Distinguished Flying Cross, Navy and Marine Corps Medal, Bronze Star Medal, Commendation Ribbon, Gold Life Saving Medal, Silver Life Saving Medal or any Army award relating to the above listed decorations, is given an Honorable Discharge provided his record, subsequent to the act for which the award or commendation was made, would so entitle him. (Art. C-10302, *Bureau of Naval Personnel Manual.*)

* *Disability.* An individual discharged as the result of disability incurred in line of duty and resulting from action against an enemy, is normally given an Honorable Discharge, regardless of previous service record or previous conduct and proficiency-in-rating marks. (Art. C-10302, *Bureau of Naval Personnel Manual.*)

† Commanding officers may recommend a different type of discharge. (Art. C-10301(3), *Bureau of Naval Personnel Manual.*)



SPECIMEN

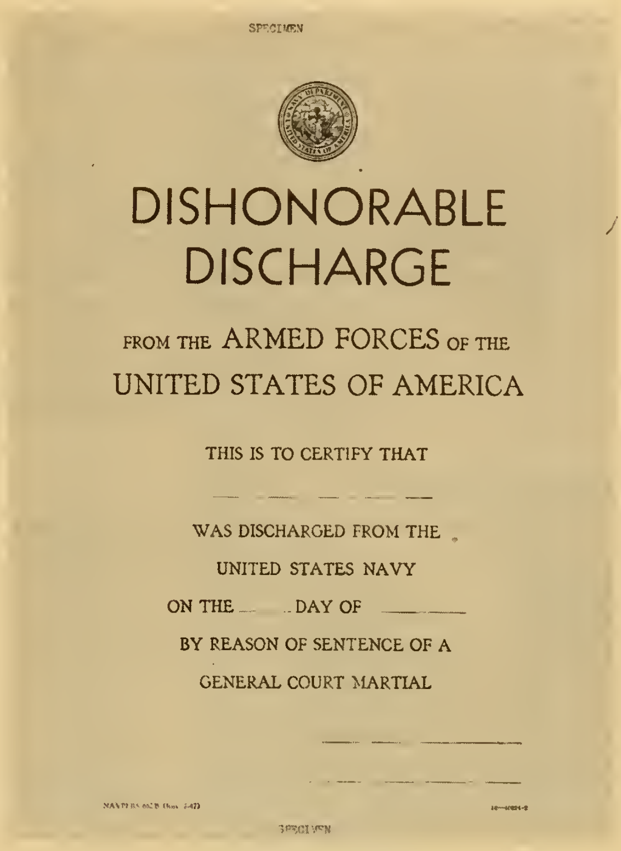
UNDESIRABLE
DISCHARGE

FROM THE ARMED FORCES OF THE
UNITED STATES OF AMERICA

THIS IS TO CERTIFY THAT

WAS DISCHARGED FROM THE
UNITED STATES NAVY
ON THE ____ DAY OF ____
AS UNDESIRABLE

UNDESIRABLE DISCHARGE



SPECIMEN

DISHONORABLE
DISCHARGE

FROM THE ARMED FORCES OF THE
UNITED STATES OF AMERICA

THIS IS TO CERTIFY THAT

WAS DISCHARGED FROM THE
UNITED STATES NAVY
ON THE ____ DAY OF ____
BY REASON OF SENTENCE OF A
GENERAL COURT MARTIAL

SPECIMEN

DISHONORABLE DISCHARGE

further provided discharge is not effected for reason of disability incurred as the result of own misconduct. (Art. C-10303(a), *Bureau of Naval Personnel Manual.*) *†

2. *General Discharge.* (Printed on white paper.) A General Discharge is given to enlisted personnel whose conduct and performance of duty have been satisfactory, but their marks and record of service do not meet the requirements for an Honorable Discharge, also to personnel discharged for reasons of unsuitability, inaptitude, and disability incurred as the result of own misconduct. (Art. C-10303(b), *Bureau of Naval Personnel Manual.*) *†

3. *Undesirable Discharge.* (Printed on white paper.) This is an administrative discharge and is given, when authorized by BuPers, to personnel discharged for causes listed below:

a. Unfitness (Art. C-10312, *Bureau of Naval Personnel Manual.*)

b. Misconduct (Art. C-13013, *Bureau of Naval Personnel Manual.*) Discharge for this reason is effected in cases of (1) personnel who have deserted and not been brought to trial, (2) personnel convicted by civil authorities or by consular court, and (3) personnel who have perpetrated a fraudulent enlistment.

4. *Bad Conduct Discharge.* (Printed on yellow paper.) A Bad Conduct Discharge may be given only in accordance with a sentence of court-martial. (Art. C-10314, *Bureau of Naval Personnel Manual.*)

5. *Dishonorable Discharge.* (Printed on yellow paper.) A Dishonorable Discharge may be given only in accordance with the sentence of general court-martial. (Art. C-10314, *Bureau of Naval Personnel Manual.*) (A discharge which results from conviction by a general court-martial on a charge of desertion in time of war deprives an individual of his Federal citizenship rights.)

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*† See footnote on preceding page.

Discharge Buttons and Emblems

a. Enlisted personnel discharged with an Undesirable, Bad Conduct or Dishonorable Discharge are not entitled to any type of naval discharge button.

b. Enlisted personnel discharged with a type of discharge which carries with it the privilege of retaining the Navy uniform after discharge are entitled to receive an Honorable Discharge Emblem. (BuPers C/L 378-44 as modified by BuPers C/L 336-45.)

c. Enlisted personnel discharged at any time with an Honorable Discharge are entitled to receive an Honorable Discharge Button, U. S. Navy or U. S. Naval Reserve, as applicable. (Art. B-2108, *Bureau of Naval Personnel Manual.*)

d. Enlisted personnel who performed active service between the dates 9 September 1939 and 31 December 1946, both dates inclusive, and who are discharged with either an Honorable Discharge or a discharge Under Honorable Conditions, are entitled to receive an Honorable Service Lapel button (men) or pin (women). (Art. B-2107, *Bureau of Naval Personnel Manual.*)

SHIP DESIGNATIONS AND NAMES

Designating Symbols

The following is a table of the symbols used to designate United States Naval vessels by type.

TYPE	CLASS	SYMBOL
Battleship	Battleship	BB
Cruiser	Heavy cruiser	CA
	Large cruiser	CB
	Battle cruiser	CC
	Flying deck cruiser	CF
	Light cruiser	CL
	Antisubmarine cruiser	CLK
Aircraft Carrier	Aircraft carrier	CV
	Aircraft carrier, attack	CVA
	Aircraft carrier, large	CVB
	Aircraft carrier, small	CVL
	Aircraft carrier, escort	CVE
	Seaplane carrier	CVS
Destroyer	Destroyer	DD
	Destroyer leader	DL
	Escort vessel	DE
	Destroyer converted to DE	DDE
	Destroyer converted for A/S work	DDK
	Destroyer escort picket	DER
Submarine	Submarine	SS
	Mine-laying submarine	SM
	Cargo-carrying submarine	SSA
	Submarine oiler	SSO
	Troop-carrying submarine	SSP
	Submarine, polar picket	SSR
Mine Vessel	Minelayer	CM
	Minelayer, coastal	CMc
	Auxiliary minelayer	ACM
	Light minelayer	DM
	Minesweeper, high speed	DMS
	Minesweeper	AM
	Minesweeper, coastal	AMc
	Minesweeper, coastal (underwater locator)	AMc(U)
	Minesweeper, harbor	AMb
Patrol Vessel	Submarine chaser (110′)	SC
	Submarine chaser (136′)	PCS
	Submarine chaser (173′)	PC
	Escort (180′)	PCE
	Escort (Rescue) (180′)	PCE(R)
	Eagle	PE
	Frigate	PF
	Gunboat	PG
	Motor gunboat	PGM
	River gunboat	PR
	Motor torpedo boat	PT
	Motorboat, submarine chaser	PTC
	Yacht	PY
	Yacht, coastal	PYc
Auxiliary	Crane ship	AB
	Collier	AC
	Destroyer tender	AD
	Ammunition ship	AE
	Provision storeship	AF
	Miscellaneous auxiliary	AG
	Amphibious force flagship	AGC
	Seagoing dredge	AGD
	Lighthouse tender	AGL
	Motor torpedo boat tender	AGP
	Surveying ship	AGS
	Hospital ship	AH
	Cargo ship	AK
	Cargo, attack	AKA
	Deep-hold cargo ship	AKD
	Net cargo ship	AKN
	General-stores-issue ship	AKS
	Cargo ship and aircraft ferry	AKV
	Lightship	AL
	Net-laying ship	AN
	Oiler, or fuel oil tanker	AO
	Gasoline tanker	AOG
Auxiliary	Transport	AP
	Transport, attack	APA
	Barrack ship, self-propelled	APB
	Coastal transport (small)	APc
	High speed transport	APD
	Administration flagship	APF
	Supporting gunnery ship	APG
	Transport fitted for evacuation of wounded	APH
	Labor transport, or barrack ship	APL
	Mechanized-artillery transport	APM

Type	Class	Symbol
	Non-mechanized-artillery transport	APN
	Troop barge, class A	APP
	Troop barge, class B	APT
	Rescue transport	APR
	Transport, submarine	APS
	Transport and aircraft ferry	APV
	Repair ship	AR
	Repair ship, battle damage	ARB
	Cable repairing or laying ship	ARC
	Floating drydock	ARD
	Repair dock, concrete	ARDC
	Advance base sectional dock	ABSD
	Mobile floating drydock	AFD
	Repair ship—internal combustion engine	ARG
	Heavy-hull repair ship	ARH
	Repair ship, landing craft	ARL
	Heavy-machinery repair ship	ARM
	Salvage vessel	ARS
	Salvage lifting vessel	ARS(D)
	Salvage craft tender	ARS(T)
	Aircraft repair ship	ARV
	Aircraft repair ship (aircraft)	ARV(A)
	Aircraft repair ship (engine)	ARV(E)
	Submarine tender	AS
	Submarine rescue vessel	ASR
	Ocean tugs:	
	Fleet	ATF
	Auxiliary	ATA
	Old	ATO
	Rescue	ATR
	Seaplane tender	AV
	Catapult lighter	AVC
	Seaplane tender (destroyer)	AVD
	Seaplane tender (small)	AVP
	Aircraft-rescue vessel	AVR
	Aviation supply ship	AVS
	Distilling ship	AW
	Water tanker	AWK
	Airship tender (lighter than air)	AZ
Landing Ship	Landing ship, dock	LSD
	Landing ship, medium	LSM
	Landing ship, medium (rocket)	LSM(R)
	Landing ship, tank	LST
	Landing ship, vehicle	LSV
Landing Craft	Landing craft, infantry (gunboat)	LCI(G)
	Landing craft, infantry (large)	LCI(L)
	Landing craft, infantry (mortar)	LCI(M)
	Landing craft, flotilla flagship	LC(FF)
	Landing craft, infantry (rocket)	LCI(R)
	Landing craft, support (large) (Mk. III)	LCS(L) (3)
	Landing craft, tank, Mk. V	LCT(5)
	Landing craft, tank, Mk. VI	LCT(6)
Miscellaneous	Unclassified	IX
District Craft	Boats:	
	Ambulance	YH
	House	YHB
	Barges:	
	Fuel oil	YO
	Gasoline	YOG
	Oil storage	YOS
	Pontoon stowage	YPK
	Sludge removal	YSR
	Stevedoring	YS
	Torpedo testing	YTT
	Water	YW
	Degaussing vessels	YDG
	Derricks:	
	Floating	YD
	Seaplane wrecking	YSD
	District auxiliary, miscellaneous	YAG
	Diving tenders	YDT
	Dredges	YM
	Ferryboats and launches	YFB
	Floating drydocks	YFD
	Floats, car	YCF
	Gate vessels	YNg
	Lighters:	
	Aircraft transportation	YCV
	Ammunition	YE
	Ash	YA
	Covered	YF
	Garbage	YG
	Open	YC
	Open cargo	YCK
	Open landing	YLA
	Torpedo transportation	YFT
	Motor minesweepers	YMS
	Net tenders	YN
	Net tenders (tug class)	YNT
	Patrol vessels, district	YP
	Pile drivers	YPD
	Pontoons, salvage	YSP
	Scows, heating	YHT
	Harbor tugs:	
	Big	YTB
	Medium	YTM
	Little	YTL
	Workshops, floating	YR
	Workshops, floating, drydocks (hull)	YRD(H)
	Workshops, floating, drydock (machinery)	YRD(M)

How Ships Are Named

Since it is often possible to identify the classification of a ship by its name, it is well to be familiar with the system which the Navy Department follows in naming vessels. There are exceptions to these rules, however. It should be noted that no vessel is named in honor of a living person. In the following section, examples for each classification will be found in parentheses.

Battleships (BB)—named for states by act of Congress. (*New York, Iowa*)

Cruisers (CA, CL)—named for cities and towns in the United States and capitals of United States' possessions and territories. (*Atlanta, Brooklyn, San Francisco*)

Cruisers (CB)—named for territories and insular possessions of the United States. (*Alaska, Guam, Hawaii*)

Aircraft Carriers (CVB, CV, CVL)—named for famous ships formerly on the Navy list and important battles. *(Ranger, Bonhomme Richard, Lexington, Saratoga, Midway)*

Aircraft Carriers (CVE)—named for bays, islands, and sounds of the United States and for battles of World War II. (*Tulagi, St. Joseph Bay, Gaudalcanal, Block Island*)

Destroyers (DD)—named for deceased persons in the following categories: American Navy, Marine Corps, and Coast Guard personnel who rendered distinguished service to their country, Secretaries and Assistant Secretaries of the Navy, members of Congress who were closely identified with naval affairs, and inventors. (*Sims, Porter, Edison, Madison, Heywood L. Edwards*)

Submarines (SS)—named for fish and denizens of the deep. (*Perch, Sturgeon, Barracuda, Whale*)

Hospital Ships (AH)—logical and euphonious words. (*Mercy, Relief, Samaritan*)

Cargo Ships (AK)—named for astronomical bodies (*Sirius, Capella*) and counties of the United States. (*Arlington*)

Repair Ships (AR)—named for characters in mythology. (*Vulcan, Prometheus*)

Ammunition Ships (AE)—words which are suggestive of fire and explosives; and names of volcanoes. (*Piro, Nitro, Lassen*)

Naval Transports (AP, APA, APR)—named in honor of deceased Commandants of the Marine Corps and Marine Corps officers; counties in the United States; places of historical interest; signers of the Declaration of Independence; famous women of history; and famous men of foreign birth who rendered aid to our country in her early struggle for independence. (*Le Jeune, Arthur Middleton, Florence Nightingale*)

Submarine Tenders (AS)—named in honor of pioneers in submarine development and also for sea deities in mythology. (*Fulton, Holland, Sperry*)

Minesweepers (AM)—named for birds; logical and euphonious words. (*Raven, Cardinal, Pursuit, Adroit*)

Submarine Rescue Vessels (ASR)—named for birds. (*Falcon*)

Gunboats (PG)—named for small cities; logical and euphonious words. (*Tulsa, Charleston, Fury, Action*)

Oilers (AO)—named for Indian names of rivers. (*Platte, Rapidan, Brazos*)

Seaplane Tenders (AV)—named for sounds. (*Puget Sound*)

Seaplane Tenders (AVP)—named for bays, straits, inlets. (*Barnegat, Greenwich Bay, Biscayne, Bering Strait, Cook Inlet*)

Net Tenders (YN)—named for trees, and (Tug Class) Indian chiefs and other noted Indians. (*Hackberry, Holly, Ebony, Yaupon, Tesota*)

Destroyer Tenders (AD)—named for localities and areas of the United States. (*Prairie, Dixie, Everglades*)

Oceangoing Tugs (ATF)—named for Indian tribes. (*Cherokee, Navajo, Apache, Choctaw*)

Harbor Tugs (large) (YTB)—named for Indian chiefs, and words of Indian dialect. (*Tecumseh, Pawtucket*)

Frigates (PF)—named for cities and towns in the United States, and towns of United States possessions and territories. (*Newport, Alexandria, Annapolis*)

Destroyer Escorts (DE)—named in honor of personnel of Navy, Marine Corps, and Coast Guard killed in enemy action in World War II. *(Lloyd E. Acree, Douglas A. Munro, Parle, Traw)*

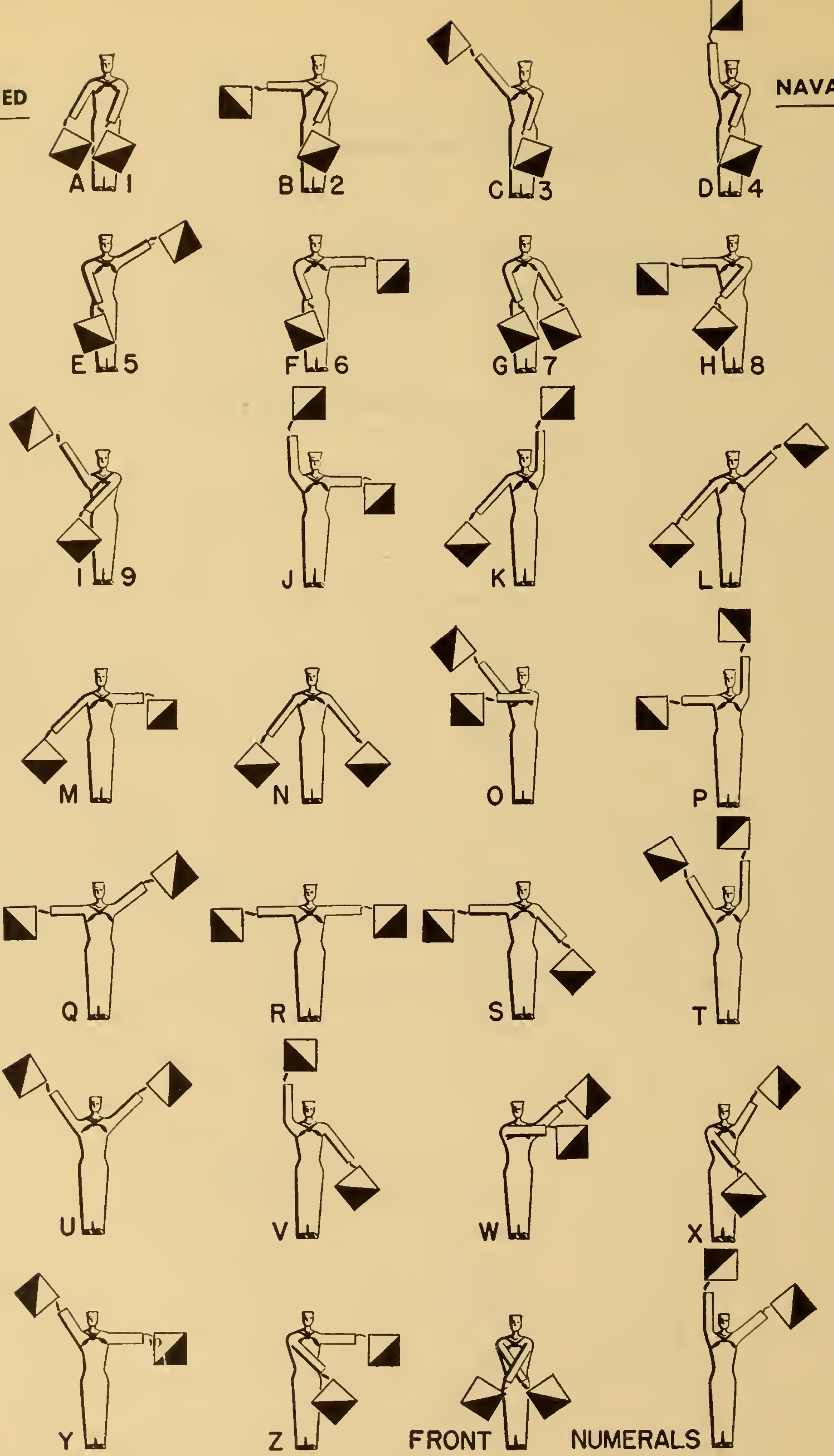
Yachts—Yachts, coastal (PY-PYc)—named for old ships formerly in the Navy; gems; also logical and euphonious words. (*Siren, Emerald, Valiant, Sturdy*)

MORSE CODE AND SEMAPHORE

The following material—the phonetic alphabet, the international Morse code, and the semaphore alphabet — is included in this book for reference purposes.

Letter	*Phonetic Name*	*International Morse Code*
A	Able	.—
B	Baker	—...
C	Charlie	—.—.
D	Dog	—..
E	Easy	.
F	Fox	..—.
G	George	——.
H	How	....
I	Item	..
J	Jig	.———
K	King	—.—
L	Love	.—..
M	Mike	——
N	Nan	—.
O	Oboe	———
P	Peter	.——.
Q	Queen	——.—
R	Roger	.—.
S	Sugar	...
T	Tare	—
U	Uncle	..—
V	Victor	...—
W	William	.——
X	Xray	—..—
Y	Yoke	—.——
Z	Zebra	——..

Number	*Phonetic Name*	*International Morse Code*
1	Wun	.————
2	Too	..———
3	Thuh-ree	...——
4	Fo-wer	....—
5	Fi-yiv	.....
6	Six	—....
7	Seven	——...
8	Ate	———..
9	Niner	————.
0	Zero	—————


A 1
B 2
C 3
D 4
E 5
F 6
G 7
H 8
I 9
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
FRONT
NUMERALS

SEMAPHORE ALPHABET AND NUMERALS

CARE OF THE UNIFORM

General Care

The longest service of the various articles of the prescribed uniform can be obtained only by proper care and maintenance. The following information is presented in order that the useful life of uniforms and equipment may be prolonged, and also that they may be worn with the justifiable pride which should distinguish the naval or military uniform.

No matter how well fitting a uniform, and especially the coat, when new, it will not continue to look its best nor keep its shape unless it is carefully put on and kept buttoned. The carrying of large or heavy objects in the pockets will speedily destroy the shape of the best coat. Uniforms should always be kept on hangers when not in use.

To Fold a Coat

When folding a coat, spread it out, lining down, on a table and turn up the collar. Straighten out the sleeves and fold each side from the lapel notch, bringing the lower corners to the center seam. Fold the coat once on the center seam. If the container is not sufficiently large to allow the coat to be packed at its full length, turn the sleeves up at the elbow before folding the coat.

Moths

Frequent brushing and exposure to sunshine and fresh air will effectually prevent moths. If uniforms are to be put away for a long time and left undisturbed they should first be thoroughly cleaned and then packed away with camphor balls, naphthalene, cedar wood, or balls of cotton saturated with turpentine.

Removing Stains

To remove oil or grease from blue uniforms. Oil or grease stains can be removed from blue uniforms by soaking a piece of blue cloth in chloroform, carbon tetrachloride, petroleum benzine, benzol, or acetone, and rubbing the spot briskly. The stain will be washed out. The solvent will rapidly evaporate.

To remove kerosene. Washing in a solution of warm soapy water will remove kerosene stains.

To remove paint stains from blue uniforms. Paint stains, while still fresh, can be removed by use of the method given above for removing oil or grease. Old and hard paint stains are difficult to remove and oftentimes impossible. The best treatment for old paint stains is to rub them hard with a piece of blue cloth saturated with turpentine.

Paraffin, wax, etc. Paraffin, wax, or similar stains can be removed by placing blotting paper over the spot and applying a hot iron to the blotting paper. Continue this, using clean blotting paper, until the spot is removed.

Iodine stains. Iodine stains can be removed by applying a solution of "Hypo" (sometimes called "anticolor") used in photography, or sodium hyposulphite, and then rinsing thoroughly with water. It may also be removed by using ordinary laundry starch. Immerse the stained part in the starch and boil; it first turns blue then disappears.

Chocolate. Cover chocolate stains with borax and wash with cold water. Then pour boiling water on the stain and rub vigorously between the hands. When dry, sponge with a little naphtha, chloroform, or benzine.

To remove rust, ink, or fruit stains from white uniforms. Rust, ink, or fruit stains can be removed from white uniforms by soaking the stained part in a solution of oxalic acid; or by putting some powdered oxalic acid or sodium or potassium acid oxalate on the stain, which has previously been moistened with water, and rubbing with a piece of white cotton or linen. The stain will dissolve and can then be washed out with water. CAUTION: Oxalic acid and its soluble salts are very poisonous, and care should be taken in handling them.

Mildew. Cold water will remove fresh mildew stains. Old mildew stains must be bleached out.

Cleaning Gold Lace (Braid), Buttons, and Cap Devices

Care of gold lace. Gold lace (braid) will rapidly tarnish and deteriorate if left in contact with or hung near any substance containing sulphur, such as rubber or ordinary manila and kraft wrapping paper.

To remove tarnish from gold lace. Gold lace can be cleaned by dipping it in a solution of potassium cyanide and rinsing it thoroughly with water. CAUTION: Potassium cyanide is a powerful poison, and extreme care must be exercised when using it. *Never under any consideration use it when hands bear cuts or scratches.* In any case, it is far safer to have an experienced tailor clean gold lace.

To clean buttons. Buttons sometimes turn green when the gold plating is worn off and the copper base becomes covered with green copper carbonate due to exposure to moist air. This can be removed by first rubbing the buttons gently with acetic acid or any substance containing this acid (such as vinegar or Worcestershire sauce) and then washing them in fresh water and drying.

Embroidered cap devices. Cap devices and other embroidered insignia may be kept new and bright by scrubbing them occasionally with a stiff brush (an old toothbrush is good) dipped in a solution of ammonia and water. This should be done as soon as there are any signs of tarnishing or corrosion for after corrosion has been allowed to continue for some time, the device cannot be restored to its original condition.

Metal cap devices. The gold part of a cap device can be cleaned by washing it with soap and water, or by rubbing it with a soft polishing cloth; the sterling silver part can be cleaned with any silver polish.

Other Hints

To remove shine from serge uniforms. The spot to be treated should be steamed by laying a wet cloth over it and pressing with a hot iron, and then rubbing it very gently with a piece of "00" sandpaper or emery cloth. This should be done by a tailor.

To repair a cut or a tear. A cut or a tear in a serge or cloth uniform can be repaired by being rewoven with threads drawn from the material in another part of the garment. Reweaving must be done by an experienced tailor. This process is rather expensive, but a cut so repaired cannot be detected after being rewoven.

To remove a singe mark. A light singe mark on a blue serge or cloth uniform should be rubbed vigorously with the flat side of a silver coin. This remedy, however, is not effective in cases of bad singeing or scorching.

GLOSSARY

AA: the symbol for antiaircraft.

Abaft: a term used to describe the position of one object relative to another, in which the object referred to is farther aft than the other. For example: the mainmast is abaft the foremast.

Abandon ship: an order for all hands to leave ship.

Abeam: in a direction at right angles to the centerline, and refers to an object outside the ship.

Abreast: alongside, or bearing 90 degrees from ahead.

Accommodation ladder: a flight of steps by which passage is afforded between a small boat and a ship.

Adrift: out of place or loose from proper attachment.

Advance force: in a joint oversea expedition, a force preceding the main part of a joint task force to the objective. The advance force normally dissolves on D-day and is redistributed to other parts of the joint task force.

Aft: at, near, or in the direction of the stern.

After: a term, usually part of the name, used to describe an object abaft a similar object as: after turret, after deckhouse.

Ahoy: the term used to hail a boat or vessel.

Airframe: the assembled principal structural components of an aircraft. It includes hull or fuselage, wings, stabilizers, vertical fins, control surfaces, landing gear, nacelles, and (lighter-than-air) envelopes.

Alive: alert.

All hands: the entire ship's company.

Aloft: above the upper deck; overhead.

Alongside: beside a pier or vessel.

Amidships: usually in the line of the keel, but sometimes halfway between bow and stern; usually corrupted to "midships."

Anchor lights: white lights visible all around the horizon and displayed by a vessel at anchor.

Anchor's aweigh: said of an anchor when it has been heaved up just clear of the bottom.

Annunciator: a signal device used to transmit orders to engine firerooms.

A/S: the symbol for antisubmarine.

Astern: the bearing of an object 180 degrees from ahead; behind the vessel; abaft the stern.

At anchor: a ship is said to be at anchor when she is held within a definite area by means of an anchor.

Athwart: at right angles to the centerlines of a vessel.

Athwartship: in a direction at right angles to the centerline.

Avast: an order to stop or cease hauling.

Awash: used when a vessel is so low in the water that water is constantly washing aboard in quantities.

Aye, aye, sir: a term used by a subordinate to his senior in acknowledgment of an order, signifying that it is understood and will be obeyed. Not to be confused with: *Yes, sir:* an affirmative answer made in reply to a senior's question. *Very well:* signifies assent and is made only by a senior to a junior.

Azimuth: an arc expressed as a horizontal angle usually in degrees or mills and measured clockwise from a reference point.

Back: to work the engines in an astern direction to back the ship or make it go astern; said of the wind when it changes direction in a counter-clockwise direction.

Ballast: heavy weights, placed in the lower hold of a vessel to increase stability by lowering the center of gravity.

Barbette: a heavily armored cylinder extending from the armored upper part of a turret down to the lowest armored deck and within which the turret rotates.

Barge: 1. a shallow-draft vessel, ordinarily not powered, used to carry cargo. Also called a "lighter" or "scow." 2. a ship's boat designated for the use of a flag officer.

Barnacles: small shellfish which are found attached to the sides of vessels, piers and driftwood.

Batten down: to close or make watertight; to secure cargo.

Battle bridge: an open platform found on some ships for use of the commanding officer during engagements with enemy aircraft.

Beam: the greatest width of a vessel; athwartship timber or member.

Belay: to make fast a rope, to cease; to rescind an order.

Below: beneath the deck or position.

Bend: to make fast; for example, to bend a cable to an anchor is to make it fast to the anchor by an appropriate hitch; a knot used in joining two lines.

Berth: an area or position suitable for a vessel to tie up or to anchor.

Bight: any part of a line inside the ends; a cove or indentation in the coastline.

Bilge: the curved part of a ship's hull where the sides and flat bottom meet.

Bilge keels: keels at the turn of the bilge that offer resistance to the rolling motion of a ship.

Bilge water: water which collects by seepage or leakage in the bilges of a ship.

Bilged: a vessel stove in at or near the bilge or curved part; also to be dropped from a midshipman's school for academic reasons.

Billet: an allotted place to sleep. It may also refer to an individual's assigned duties aboard ship.

Binnacle: a box and stand made of brass or some other nonmagnetic metallic material and used as a container for the compass.

Binnacle list: a sick list; includes the names of those excused from duty by the medical officer.

Bitter end: the end of a line or the last link of a cable that is doing important work.

Bitts: a pair of iron or wooden heads on board ship set vertically in the deck to which mooring or towing lines are made fast.

Black gang: that part of the ship's company which comprises the engineer's force.

Blinker: a set of lights at the masthead or on the end of either yardarm, connected with a telegraph key; by means of this device signals are sent in International Morse Code.

Blister: a bulge built in a man-of-war's side as a protection against torpedoes, and capable of being flooded or pumped out.

Boat: any small craft that can be hoisted aboard a ship.

Boat boom: a spar swung out horizontally and at right angles from the side of a vessel at anchor and to which small boats are secured.

Boatswain's chair: the board on which a man sits when swung aloft or over the side to work.

Bollard: an upright wooden or iron post on a dock to which hawsers may be secured; sometimes called a "nigger head."

Booby hatch: a small opening in the deck forward or aft of the main hatches, used to facilitate communication below or to the deck.

Boom: a spar having many uses; the foot of a fore and aft sail is laced to a boom; boats are secured to boat booms; cargo booms are used for handling cargo; a line of logs may be used to form a floating chain to obstruct the passage of boats or restrict a quantity of logs to a certain area.

Bow: forward end of a boat or ship.

Bower anchors: two heavy anchors carried in the forward part of the vessel, and ordinarily used in anchoring.

Breaker: a small water-cask used in a ship's boats; surf.

Break out: get out, take out of stowage.

Bridge: a raised athwartship platform from which the vessel is usually steered and navigated.

Brig: the ship's prison.

Bright work: all metal work that is kept polished; also unpainted woodwork that is kept sanded or scrubbed to show the clean, bare wood.

Broadside: the side of a vessel above water; the simultaneous firing of all guns on one side of a warship.

Brow: a portable gangway from a vessel to a pier, wharf, or float.

Bulkhead: wall; partition separating portions of a ship.

Burdened vessel: the vessel required by the Rules of the Road to keep clear of another vessel.

Bulwark: the light plating or wooden extension of the ship's sides above the upper deck.

Bunk: a built-in bed aboard ship.

Buoys: floating beacons, moored to the bottom, which by their shape and color convey valuable information as to position.

Burgee (bur'jee): swallow-tailed flag used as a distinguishing pennant.

Cabin: the quarters of the captain; the enclosed space of a decked-over small boat.

Cable: a heavy rope or chain, generally used in reference to chain or rope bent to the anchors.

Call: the boatswain's pipe.

Camel: a float very stoutly constructed and used as a fender to keep a vessel off a wharf or other vessel.

Capstan: a vertical barrel situated on the forecastle and geared on the windless; used for heaving in anchors and hawsers.

Carry away: to tear loose, break; part, or wash overboard.

Carry on: an order to resume previous activity after an unscheduled interruption.

Cast: to throw; to throw a vessel to port or starboard in getting underway by the use of the rudder, or rudder and engines.

Cast off: to let go a line.

Caulk (cork) off: to sleep.

Chafe: to wear the surface of a rope, spar, or boat by rubbing.

Chafing gear: a guard of canvas or rope around spars or rigging to take the wear.

Chain of command: the succession of commanding officers from a superior to a subordinate through which command is exercised. Also called *Command channel.*

Chains: platforms forward extending out over the water on either side of a ship and used by the leadsman in taking soundings.

Charley Noble: the galley smoke-pipe.

Chart: a map for the use of navigators.

Chart house: the compartment used by the navigator for his work.

Check: to ease off slowly; to stop a vessel's way gradually by means of a line made fast to a dock or anchor on the bottom.

Chock-a-block (two-blocked): the situation when two blocks of a tackle are drawn as close together as possible; full.

Chock: an iron casting, with jaws, which serves as a lead for lines to a wharf or other vessel; a convenient block of wood for supporting boats, weights, etc.

Chow: food.

Cleat: a fitting of wood or metal with two projecting horns around which ropes are made fast.

Close aboard: near; in close proximity to.

Coaming: the raised framework about deck openings and cockpits in open boats; used to prevent the entry of water.

Collision bulkhead: a partition in the forward part of the ship, constructed of sufficiently heavy material to stand the great strain if the bow should become damaged.

Colors: the national flag; the ceremony which takes place when the flag is raised at 0800 and lowered at sunset.

Combined: pertaining to an organization or an activity employing forces or agencies of two or more allies, acting together to accomplish a common mission. See *Joint.*

Combat loading: the loading of assault troop units with their essential combat equipment and initial combat supplies in the same vessel and in a manner permitting immediate and rapid debarkation in a desired priority for landing attack.

Commission pennant: the official pennant flown at the main truck of a man-of-war when in command of a commissioned officer of less than flag rank.

Companion ladder: a ladder connecting the quarterdeck and the officers' quarters.

Companionways: sets of steps or ladders leading from one deck level to another.

Compartments: spaces below decks between bulkheads.

Conning: directing the steering of a ship by orders to the steersman.

Conning tower: a heavily armored structure, just forward of and slightly below the bridge housing all control apparatus on the bridge.

Control vessel: in an amphibious operation, a vessel to guide, and to act as a headquarters for the control of waterborne traffic to and from the beach.

Convoy: 1. a train of vehicles usually accompanied by a protecting escort. 2. one or more noncombatant ships accompanied, during all or part of the voyage, by one or more escort units as protection against enemy attack. 3. To accompany in order to protect.

Countermeasures: that form of military science which by the employment of devices and/or techniques has as its objective the impairment of the operational effectiveness of enemy activity.

Country: the space adjacent to and used for access to a compartment or quarters as, the cabin, wardroom, and head country.

Course: the direction steered by a vessel, expressed in degrees.

Cover: 1. to protect, by land, air ,or sea, by offense, defense, or threat of either or both. 2. shelter or protection, either natural or artificial, from enemy fire. *Cover address:* is one utilized for the transmission of a message to an addressee other than the person actually addressed. *Cover name:* is a name other than one's own adopted for intelligence purposes.

Coxswain (coxsun): the enlisted man in charge of a small boat and usually serving as steersman.

Crossing the line: crossing the earth's equator.

Crow's nest: a lookout station consisting of a platform usually on the foremast.

Cut-of-the-jib: general appearance of a vessel; sometimes applied to the appearance and mannerisms of a person.

Damage control: measures necessary aboard ship to preserve watertight integrity, stability, and maneuverability; to control list and trim; to effect rapid repairs of material; to provide adequate protection from fire and chemical agents, and to facilitate care of wounded personnel.

Davits: (pronounced dā'vits) small cranes that project over the ship's sides and are used for hoisting and lowering boats.

Davy Jones' locker: the bottom of the sea.

Day's duty: a tour of duty on shipboard lasting 24 hours.

D-day: 1. The term used to designate the unnamed day on which an initial assault landing or phase of operations is to commence. "D" is the most commonly employed designation, but any other letter may be used.

Dead ahead: directly ahead on the extension of the centerline of the vessel.

Dead in the water: said of a ship when the ship has no headway or sternway in water.

Dead light: a heavy round glass lens set flush and permanently into decks and bulkheads for admitting light or permitting observation.

Debarkation: the unloading of troops, equipment, or supplies from a ship or an aircraft.

Deck: corresponds to the floor of a building.

Depth charge: an encased explosive whose trajectory under water results from the force of gravity, capable of being exploded during its descent.

Declassify: to remove or reduce the security classification of a class of material, information, or a document.

Derelict: abandoned floating vessel at sea.

Detonation: a sudden and violent explosion. Detonation is practically instantaneous. The slower burning of some explosives is called deflagration.

Dinghy (pronounced dingey): a small handy boat, 16 to 20 feet in length; may be propelled either by oars or sail. (Nickname: "Dink".)

Dip: a position of a flag when it is hoisted about two-thirds way up; to lower a flag part way, and then hoist it again as a mark of courtesy to a passing vessel.

Directive: 1. a military communication in which a policy is established or a specific action is ordered. 2. a plan issued with a view to placing it in effect when so directed, or in the event that a stated contingency arises. 3. broadly speaking, any communication which initiates or governs action, conduct, or procedure.

Displacement: the weight of the water displaced by a vessel; this weight is equal to the weight of the vessel.

Disposition: 1. distribution of the elements of a command and the duties assigned to each unit to accomplish a common purpose. 2. a prescribed arrangement of the stations to be occupied by the several formations and single ships of a fleet, or major subdivisions of a fleet, for any purpose, such as cruising, approach, maintaining contact, or battle. 3. in aviation, a prescribed arrangement of all the tactical units composing a flight or group.

Ditty-bag: a small canvas bag used by sailors to stow small articles of gear.

Dive bombing: a type of bombing in which the bomb is released when the airplane is in a dive at an angle of more than 60° from the horizontal.

Dogs: small, bent metal fittings used to secure watertight doors, hatch covers, manhole covers, etc.; also metal rods which are driven into blocks at the bottom of a dry dock to prevent blocks from floating.

Dog watch: one of the 2-hour watches from 1600 to 2000. The first dog watch is from 1600 to 1800 and the second dog watch is from 1800 to 2000.

Dory: a small flat-bottomed boat with a sharp sheer, especially seaworthy and used chiefly by fishermen.

Double bottoms: watertight subdivisions of a vessel next to the keel and between the outer and inner bottom, protecting the ship in case of damage to the outside plating.

Double up: to double a vessel's securing line when she is moored to a dock.

Draft: the depth of water from the waterline to the keel of a boat or ship.

Drift lead: an ordinary sounding lead and line that is dropped over the side of the ship to indicate any dragging of the vessel.

Drone: a remotely controlled aircraft.

Dungarees: blue overalls used for work.

Echelon: 1. the subdivisions of a headquarters, as forward echelon, rear echelon. 2. separate levels of command; as compared to regiment, division is a higher echelon, battalion is a lower echelon. 3. the different fractions of a command in the direction of depth, to each of which a principal combat mission is assigned; e.g., attack echelon, support echelon, reserve echelon. 4. a formation in which the subdivisions are placed one behind another, extending beyond and unmasking one another wholly or in part.

Embarkation: the loading of troops with their supplies and equipment embarked into vessels and/or aircraft.

Engine speed indicator: a device found on the bridge and in the engine room which indicates the number of revolutions per minute the propeller shafts are making.

Ensign: a flag, the emblem of a vessel's nationality; a junior officer of the Navy.

Escort: 1. to convoy. 2. a combatant unit or units assigned to accompany and protect a weaker force. 3. airplanes assigned to protect other aircraft during a mission. 4. an armed guard that accompanies a convoy, a train, prisoner, etc. 5. an armed guard accompanying persons as a mark of honor.

Exercises, joint: exercises in which at least two or more of the Armed Forces (Army, Navy and Air) take part.

Grand Joint Exercises: joint exercises that involve the United States Fleet as a whole or one or more of its major subdivisions and equivalent Air Force or Army forces, and which require Joint Board or Joint Chiefs of Staff coordination.

Minor Joint Exercises: joint exercises other than grand joint exercises.

Eyes: the very forward part of a ship; on the weather deck in the bow.

Fairway: an open channel, mid-channel.

Fantail: the space in the overhang of the stern; the after section of the maindeck.

Fast: to make fast is to secure.

Fathom: 6 feet; used as a measure of the depth of water.

Fathometer: an electrically operated apparatus used for measuring automatically the depth of the water.

Feeling the way: to proceed slowly, sounding the depth of the water and with caution.

Fender: a device of canvas, wood, or rope, used over the side to take the shock of contact between ship and wharf or other vessel when alongside.

Fend off: to prevent touching by pushing off in coming alongside, or in leaving a pier or vessel.

Field day: a day set aside for scrubbing and general cleaning aboard ship.

Fire power: 1. the ability to deliver fire. 2. the amount of fire delivered by a ship, an aircraft, a unit or a particular weapon.

First lieutenant: the commissioned officer having charge of the cleanliness, efficiency and general upkeep of a vessel's hull. This is a duty and not a rank.

Fix: an accurate determination of latitude and longitude by piloting methods, celestial navigation, use of radio direction finder (RDF) bearings, or other method.

Flag officer: an officer having the rank of commodore or higher, so called because he is entitled to fly his personal flag which indicates his rank.

Flagstaff: the small vertical spar at the stern to which the ensign is hoisted while at anchor.

Fleet: an organization of ships and aircraft under one commander, normally comprising all types of ships and aircraft necessary for major operations.

Flogging: a form of punishment used in the early Navy; now abolished by law.

Flood tide: that period in the tidal current when the water is flowing toward the land.

Flotsam: floating goods or wreckage.

Fogy: an increase in pay due to length of service.

Fore and aft: in a direction parallel to the centerline.

Forecastle (foc'sul): the upper deck forward of the foremast and included in the bow area.

Foremast: the first mast of a ship abaft the bow.

Foretop: a heavy structure supported by the foremast in which fire control equipment is housed.

Forward: in the direction of the bow, or fore part of the vessel.

Foul: jammed; the opposite of clear.

Foul anchor: said of an anchor when the chain is twisted about it.

Freeboard: the distance from the main deck to the water.

Gadget: (also gilguy) a convenient name given to objects whose real names are not known—considered a lubberly expression.

Gaff: a small spar abaft the mainmast that extends at an angle of about 40 degrees with it.

Galley: a Navy kitchen.

Gangplank: a temporary bridge connecting the ship with the shore.

Gangway: a passageway at a ship's side for boarding or leaving; an order to stand aside and clear a path.

Garble: any instance of unintentional departure from the correct in any part of a message or transmission .

Gear: a general term for a collection of spars, ropes, blocks, or sundry equipment.

General quarters: the naval condition of readiness when action is imminent. All battle stations are fully manned and alert; ammunition is ready for instant loading; guns, except those requiring time-fuze settings, may be loaded.

Gig: a ship's boat designated for the use of the captain.

Glass: a mariner's name for a barometer or a spyglass.

Go adrift: to break loose.

Grapnel: a small anchor with several arms used for recovering lost articles or bodies of drowned persons from the bottom, or for anchoring dories or skiffs.

Gratings: wooden or iron openwork covers for hatches, bunker holes, etc.

Ground tackle: a term used to include all anchor gear.

Guess warp: a line at the outer end of a boat boom, used for securing a boat to the boom; a hauling line laid out by a boat.

Guided missile: a missile containing a device designed to steer it and/or change its acceleration in response to signals received during flight. Abbrev: GM.

Gunwale (gunnel): the upper edge or rail of a vessel or boat's side.

Guy: a steadying rope used to support a spar in a horizontal or inclined position.

Hail: to address a nearby vessel. Also, a man or vessel *hails* from his or her home port.

Half-mast: the position of a flag when hoisted halfway; used as a mark of respect for the dead.

Halyards or halliards: lines used for hoisting flags and sails.

Hand: a member of the ship's crew. To "bear a hand" is to hurry up.

Hand lead: a lead weighing from 7 to 14 pounds, attached to a lead line and used for measuring the depth of water.

Handsomely: to ease off on a line gradually; to execute a deliberate, careful maneuver with a vessel.

Hash mark: a red, gold, or blue diagonal stripe across the sleeve of an enlisted man's uniform signifying the number of previous enlistments, one hash mark for 4 years of active service.

Hatches: deck openings providing vertical access to a space below decks.

Haul: to pull. The wind hauls when it changes direction clockwise, but the most popular term for this is veering.

Hawsepipes and hawse holes: the iron castings in the bow through which the anchor chains run are the hawsepipes, the openings the hawse holes.

Hawser: a heavy line, 5 inches or more in circumference, used for heavy work such as towing or mooring.

Head: the compartment having toilet facilities.

Head room: the clearance between decks.

Heads up: a warning to look out or clear a passageway.

Headway: when the vessel is moving forward (ahead).

Heave: to throw; exert a pull on a line; the rise and fall of a vessel at sea.

Heave away: an order to start heaving on a capstan or windlass, or to haul on a line.

Heave short: heave in on the anchor chain until the vessel is nearly over the anchor but with little more chain out than the depth of the water.

Heave the lead: take a sounding with the hand lead.

Heave to: to bring the vessel's head or stern to the wind or sea and hold her there by the use of the engines and rudder.

Heaving line: a light line having a "monkey fist" or small weighted bag at its end to aid in throwing. It is thrown to a pier or another vessel as a messenger for a hawser.

Heel: to list over; a vessel turns on her heel when she turns in a short space.

H-hour: 1. the term used to designate the hour for an attack to be launched or for a movement to begin. 2. in an amphibious operation, the clock time designated for the first wave to land on the designated beach. Other letters of the alphabet may be used; e.g., F-hour, G-hour.

Hit the deck: a phrase used in breaking a naval crew out of their hammocks; at reveille the same as "Rise and shine."

Hoist: a display of signal flags at the yardarm; to elevate an object or piece of cargo.

Hold: a large lower compartment of a vessel for the stowage of ballast, cargo, and stores.

Holiday: an unpainted, unvarnished, or unfinished spot on the spars or about the vessel.

Holystone: a brick of sandstone used for cleaning decks and whitening decks by hauling it back and forth; small ones used around corners are called "prayer books."

House: to stow or secure in a safe place.

Hug: to keep close.

Hull down: said of a vessel when it is so far distant that only its masts are showing above the horizon.

Hunter-killer operations: coordinated aggressive antisubmarine operations by surface and/or air to search for and destroy enemy submarines.

Identification: the identification by any act, or means, of your own friendly character or individuality.

Idlers: members of a ship's company having no night watches.

IFF (identification, friend or foe): a system of radio interrogation and reply (if friend) generally used in connection with radar for identifying an aircraft, ship, or craft.

Inboard: toward the centerline in relation to the sides of the vessel.

Inshore: toward the land.

Interior communication: rapid communication facilities, electrical, acoustical, or mechanical, interconnecting the various operational spaces of a naval vessel, aircraft, or other activities.

Irish pennant: an untidy loose end of a line.

Jack: the flag similar to the union of the national ensign; a device for moving pieces of equipment or cargo.

Jackstaff: a small vertical spar at the bow of the ship from which the jack is flown while at anchor.

Jacob's ladder: a ladder made of rope used over the side and aloft.

Jet propulsion: reaction propulsion in which the propulsion unit obtains oxygen from the air as distinguished from rocket propulsion in which the unit carries its own oxygen-producing material. In connection with aircraft propulsion, the term refers to a gasoline or other fuel turbine jet unit which discharges hot gas through a tail pipe and a nozzle, affording a thrust which propels the aircraft.

Joint: connotes activities, operations, organizations, etc., in which elements of more than one Service of the National Military Establishment participate.

Jump ship: to leave a ship without permission; to desert.

Keel: the timber or bar running the entire length of the hull from stem to sternpost and forming the backbone of a vessel from which rise the frames or rigs, stems, and sternpost.

Keelhaul: an ancient form of punishment in which a man was hauled down one side of the vessel, under the keel, and up the other side; to reprimand.

Knock off: to stop doing something; especially to stop work.

Knot: a measure of speed, not distance, equal to one nautical mile (6080 ft.) per hour; a tie or fastening formed with a line.

Ladder: a stairway.

Landing craft: a craft which is especially designed for beaching, unloading or loading on the beach, and retracting.

Landing ship: a large type assault ship generally over 200 feet long which is designed for long sea voyages and for rapid unloading over or onto a beach.

Lanyard: a rope made fast on an article to secure it; for example, knife lanyard, bucket lanyard, etc.

Lash up: secure; tie up; make fast.

Lashing: the rope used to lash.

Lay: a preliminary order meaning "to go," for example, lay aloft, lay aft, lay forward, lay below, etc.; the direction of the twist of the strands of a rope.

Lead line: the line which is attached to the lead used in taking soundings.

Leadsman: the man detailed to the chains for heaving the lead in taking soundings.

Lee: away from the direction of the wind.

Leeward: (lu'ard) away from the wind.

Lend a hand: to help.

Liberty: permission to be absent from the ship or station for a short period of time (less than 72 hours).

Lie to: a vessel is said to lie to when the anchor is up, when not aground, or fast to the shore but with no way upon her.

Lighter: a small vessel used for discharging or loading vessels anchored in harbors.

Line: the seagoing term for a piece of rope. See *Rope.*

List: the leaning of a vessel due to greater weight upon one side.

Locker: a small stowage compartment either in the form of a chest or a closet.

Log: a device used to measure the ship's speed through the water; to make an entry in a ship's logbook; also used frequently instead of logbook.

Logbook: a book containing the official record of a ship's activities along with other pertinent data relative to the ship's navigation; it is a complete chronological history of the ship from the time she is first commissioned until she terminates her seagoing career.

Lookout: the man stationed above decks for observing and reporting objects seen.

Loran: a long range radar navigation system, which utilizes a pulse technique to determine ranges, from two or more stations, by which aircraft or surface vessels thereby establish their location.

Lucky bag: a locker or compartment into which pass stray articles found about a naval vessel.

Main deck: the highest complete deck extending from stem to stern and from side to side.

Mainmast: the second mast from the bow of a ship having two or more masts. If a ship has but one mast, it is considered the mainmast.

Maintop: the top of the mainmast.

Marlinspike: a pointed iron instrument used in splicing rope and wire.

Mast: the vertical spar supporting the signal yard; the daily ceremony of bringing delinquents in discipline before the commanding officer.

Masthead: the top of the mast.

Meal pennant: a red pennant hoisted from the port yardarm of a naval vessel at anchor when the crew is at mess. Popularly called "chow rag" or "bean rag."

Mess: to eat; a group of persons eating together.

Messenger: a light line made fast to a hawser for the purpose of heaving the latter in; the enlisted man who attends and runs errands for the officer of the deck.

Mess room (hall): a space where members of the crew eat their meals.

Monkey fist: a complicated knot with or without weight enclosed, worked into the end of a heaving line.

Nest: a method of boat stowage in which one boat is placed inside another.

Net: 1. a group of inter-communicating radio or landline stations. 2. a flexible barrier of steel mesh used to block entry to waterways, to protect against torpedoes, etc.

Niggerheads: bollards; sometimes applied to winch heads.

Officer of the deck: an officer taking his turn in charge of the ship. He acts as the captain's representative and as such is senior to all officers except the captain and the executive officer.

On board: aboard, anywhere on a ship.

On soundings: to be within the 100-fathom curve; to navigate by the use of soundings.

Operation: a military action, or the carrying out of a military mission, strategic, tactical, service, training, or administrative; the process of carrying on combat on land, on sea, or in the air, including movement, supply, attack, defense, and maneuvers needed to gain the objectives of any battle or campaign.

Opposite numbers: American and foreign military officers having corresponding assignments within their respective military establishments.

Outboard: toward the sides of the vessel in relation to the centerline; or outside the vessel entirely.

Out of trim: to carry a list or to be down by the head or stern.

Overhead: ceiling.

Painter: the line in the bow of a small boat for towing or making fast.

Paravanes: sometimes referred to as "otter gear," torpedo-shaped devices which are towed on either side of a steamer's bow for the purpose of deflecting and cutting mines adrift.

Part: to break, as of a rope or line.

Passageways: corridors or hallways used to facilitate horizontal movement between compartments on board ship.

Pass the word: to repeat an order or information to the crew.

Pay out: to let out chain or ease off on the line.

Phonetic alphabet: a list of standard words used to identify letters in a message given by radio or telephone, such as Baker for B or King for K. (By standard dictionary definition a misnomer but accepted because of common military usage.

Pigstick: a small spar projecting above the top of the mainmast for which the ship's commission pennant is flown.

Pip: the figure presented on the oscilloscope of a radar caused by the echo from an aircraft or other reflecting object. Also called *Blip* and *Break*.

Pipe down: an order to keep quiet or stop talking; an order dismissing the crew from an evolution (drill).

Pipe the side: the ceremony at the gangway in which side boys are formed and the boatswain's pipe blown when an official comes aboard or leaves a naval vessel.

Pooped: a term applied when the sea breaks over the stern of the vessel.

Port: the left side of a vessel when facing forward; an opening in a ship's side; a harbor for embarkation and discharge of cargo.

Pyrotechnics: ammunition containing chemicals that produce a smoke or brilliant light in burning, used for signaling or for lighting up an area at night, fireworks.

Quarter bill: a list of all men and officers and their stations on board ship.

Quarterdeck: that part of the main or other appropriate deck set aside for the conduct of official and ceremonial functions. The commanding officer of the ship defines the limits of the quarterdeck.

Quarters: living compartments; assembly of the crew.

Radar: 1. the principle of locating reflective targets or objects by the measurement of the reflected pulses of radio frequency energy. 2. a term applied to devices which make use of the radar principle. The word was derived from a contraction of the phrase "radio detection and ranging."

Radar picket: any ship stationed at a distance from the force protected, for the purpose of increasing the radar detection range.

Recognition: the process of determining the friendly or enemy character of a person or an object.

Relative bearing: the direction of an object measured clockwise in degrees from a ship or aircraft heading.

Relieving (watch, etc.): to take over the duty.

Ride: to lie at anchor; the way a vessel takes the seas is the way she rides them.

Rigging: the ropes of a ship; particularly those securing masts, booms, etc.

Rise and shine: a rising call for all members of the crew to turn out of their bunks and hammocks. "Hit the deck" may also be used for the same purpose.

Rocket: a self-propelled missile, using rocket propulsion, fired from a relatively light and mobile launching device.

Rocks and Shoals: familiar term for Articles for the Government of the Navy.

Roger: 1. a word used to indicate that a voice message has been received. It is the equivalent of the letter "R", standing for received. 2. in the phonetic alphabet the word is used to identify the letter "R".

Rope: a general civilian term applied in the Navy to bulk cordage or wire only; distinct from the Navy term line. Some exceptions exist where the Navy gives special names to ropes for specific purposes, as *bolt rope, foot rope, hand rope, jaw rope, man rope, slip rope, bell rope, wheel rope, head rope*, etc.

Rough log: the rough pencil draft of the record kept on the bridge or in the chart house, of the movements of the vessel, activities carried out on board, or any pertinent items concerning ship or personnel.

Rules of the Road: any of the rules making up a code governing vessels as to the lights to be carried, the signals to be made, and the action of one vessel with respect to another, when risk of collision exists. The International Rules of the Road apply on the high seas. The Inland Rules of the Road apply in United States waters within certain geographical limits and on the Great Lakes and certain rivers. The Pilot Rules amplify the Inland Rules.

Running lights: all lights required to be shown during peacetime by a vessel, airplane or airship when underway between sunset and sunrise.

Sail ho: the report of a lookout that a vessel has been sighted.

Screw: the propeller.

Scuttlebutt: a modern vessel's drinking fountain.

Scuttlebutt story: a rumor without authority.

Sea bag: a cylindrical canvas bag in which bluejackets stow their clothing and other gear.

Sea chest: a bluejacket's trunk; the portion of a intake between the ship's side and the sea valve.

Sea frontier: the naval command of a coastal frontier including the coastal zone in addition to the land area of the coastal frontier.

Sea ladder: a rope ladder for use over the ship's side at sea.

Sea lawyer: a seaman who is prone to argue against authority.

Sea marker: a powder dye which when thrown on water surfaces makes a bright colored area which can be easily seen from the air, thus facilitating rescue operations.

Sea-painter: a long line leading from the bow of a lifeboat to the ship and used to shear the lifeboat clear of the ship when the boat is water-borne.

Search and rescue: the use of aircraft, surface craft, submarines and other special equipment employed for the rescue of personnel in distress on land or at sea.

Second-deck: the first complete deck below the main deck.

Secure: to make fast; safe; the final part of a drill or exercise devoted to stowing all gear and making everything shipshape, after which the men may be dismissed.

Service force: in naval usage, a task organization which performs missions for the logistic support of operations.

Set the watch: the order at 2000 on a naval vessel to station the first watch.

Shakedown cruise: a cruise of a newly commissioned ship for the purpose of adjusting machinery and instruments and familiarizing the crew with the vessel.

Shipshape: in a neat and orderly manner as is the custom aboard ship.

Short stay: when the ship has been brought up to the anchor so that the scope of chain is one slightly greater than the depth of the water.

Show a leg: an order to make haste.

Sick bay: the ship's hospital; dispensary.

Side boys: the men manning the side in honor of some visiting officer or official.

Side fender: a longitudinal timber projecting beyond the outside of the hull planking, often metal-faced, to protect the hull.

Signal bridge: an open platform located near the navigating bridge from which signalmen maintain visual communication with other ships in the vicinity.

Single up: an order referring to the lines out at a pier securing a vessel; to single up is to reduce the number of parts out to one, preliminary to sailing.

Small stores: personal needs for seagoing men, such as articles of clothing.

Smart: snappy or seamanlike.

Snub: to check a chain or hawser suddenly.

Sonar: Sonic navigation and ranging device.

Sortie: 1. a sudden attack made from a defensive position. In this meaning it is sometimes called sally. 2. an aircraft airborne on a mission against the enemy. 3. the set of photographs obtained on a photographic mission. 4. in naval usage, to depart from a port or anchorage, with an implication of departure for operations or maneuver.

Speed cones: conical shapes exhibited by naval vessels to indicate their engine speeds to those in formation astern.

Splinter deck: the protective deck having the lightest plating.

Square away: put in proper place; finish.

Stanchions: upright pillars either of wood or steel used to support various decks.

Stand by: an order to be prepared to execute an order or maneuver; a seaman who is subject to call if needed during a watch.

Starboard: the right side of a vessel looking forward.

Station bill: a bill which is posted in the crew's quarters or some conspicuous place listing the stations of the crew at maneuvers and emergency drills.

Stem: the apex of the bow, the upright timber in the forward part of a boat, joined to the keel by a knee; to stem a current or tide is to head into it and make way against it.

Stern: the after end of a vessel.

Sternway: when the vessel is moving backward.

Stow: to put gear in its proper place.

Strafing: the firing at ground targets or vessels by aircraft at close range.

Strategy: the art and science of developing and using the political, economic, psychological, and armed forces of a nation, during peace and during war, to afford the maximum support to national policies, in order to increase the probabilities and favorable consequences of victory and to lessen the chances of defeat.

Striker: a nonrated man who is qualifying for a petty officer's rate.

Superstructure: includes all equipment and fittings other than armature extending above the hull.

Tackle (tay-kle): a purchase composed of blocks and lines.

Tactics: 1. the employment of units in combat. 2. the ordered arrangement and maneuver of units in relation to each other and/or to the enemy.

Tarpaulin: a heavy, treated canvas used as a covering; also called *paulin.*

Task force: 1. a temporary grouping of units under one commander, formed for the purpose of carrying out a specific operation or mission. 2. a semipermanent organization of units under one commander for the purpose of carrying out a continuous specific task. 3. a major subdivision of a fleet or of any independent command organized for the accomplishment of a specific task.

Tend: to man; the direction the cable leads when a ship is anchored.

Theater of war: that area of land, sea, and air which is, or may become, involved directly in the operations of war.

Third deck: the second complete deck below the main deck.

Thwarts: athwartships seats in a small boat.

Thwartships: at right angles to the centerline; from side to side.

Tompion (tomp'kin): a plug fitted in the muzzle of a gun to protect against weather.

Transport quartermaster: the troop officer designated to plan and supervise in general the loading and unloading of troops, equipment, and supplies for an amphibious operation. Each ship transporting personnel or cargo, each major command, and each subordinate command, down to and including the battalion or its equivalent, normally has a transport quartermaster. Abbrev: TQM.

Train: the supporting force of the fleet which consists of the supply vessels, oilers, ammunition and repair ships, etc.; to aim a gun or searchlight horizontally.

Trick: a period of duty of the steersman on the steering wheel.

Turn to: an order to commence ship's work.

Two blocked: the condition when the two blocks of a tackle have been drawn together as close as possible by hauling on a fall.

TWX: the symbol of teletypewriter exchange.

Type organization: a subdivision of a fleet or force comprising all ships of the same type attached to such fleet or force, together with such flagships, tenders, and aircraft as may be assigned.

Unbend: to cast adrift or untie; loosen.

Under hack: said of an officer who is confined as a result of a minor infraction of naval discipline.

Underway: a vessel is said to be underway when she is not at anchor, nor made fast to the shore or another ship, nor aground.

Uniform of the day: that uniform which is prescribed to be worn at a particular time.

Unmoor: to heave up one anchor leaving the other down; to cast off mooring lines.

Up anchor: an order given to heave up the anchor and get underway.

Upper deck: a partial deck above the main deck amidships.

'Vast: an order to stop heaving.

Veer: to pay out chain or line; when the wind changes direction clockwise or to the right, it is said to veer.

Waist: the middle part of a vessel, or midships between bow and stern.

Wardroom: the officers' mess and lounge room.

Watch: a period of time on duty, usually four hours in length; said of an anchor buoy which is watching, or indicating the position of the anchor on the bottom.

Water breaker: a small cask used for holding drinking water, usually carried in ship's boats or rafts.

Weather deck: a deck having no overhead protection; the uppermost deck.

Weigh: to raise the anchor off the bottom.

Well: an order meaning sufficient.

Wheel: the steering wheel of the ship.

Where away: a question directed to a lookout reporting a light, sail, or other object; he is expected to answer, giving the bearing.

Wide berth: keeping at a comfortable distance from a ship, shoal, or shore.

Winch: a piece of machinery which operates a horizontal shaft, fitted with drums by which lines are hove in.

Window: the name for strips of frequency-cut tinfoil, metal, wire, or bars usually dropped from planes or expelled from shells or rockets as a radar countermeasure.

Windward: toward the wind.

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